Apr 4th, 1:30 PM - 1:45 PM

Assessing harmful algal bloom risk in Puget Sound: a coupled modeling-data analysis approach

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Speaker
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(Pacific Northwest National Laboratory)
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(NOAA NW Fisheries Science Center)
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(Univ. of Wash. Climate Impacts Group)
Jerry Borchert, Audrey Coyne
(WA Dept. of Health)

Salish Sea Ecosystem Conference April 4th, 2018

Background and Goals

- Projected increase of HAB threats to shellfish harvest and associated economic impact to coastal communities
- Need for better forecasting tools for HAB occurrence and biotoxin risk
- Monitoring resources limited, strategic resource allocations necessary

GOAL:

Better understand HAB risk to support improved management of shellfish monitoring now and in the future

Why Paralytic Shellfish Poisoning (PSP)?

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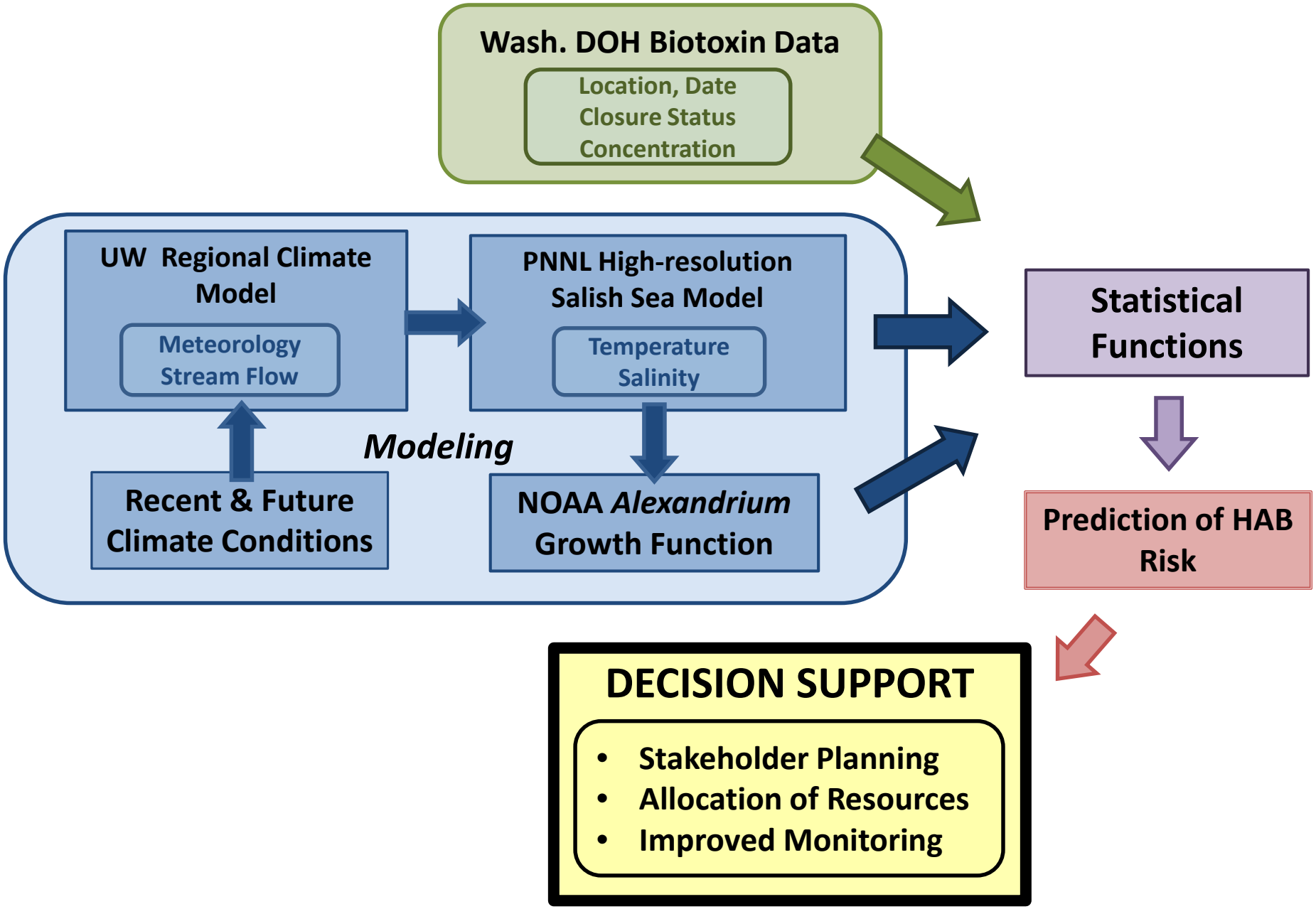
- *Alexandrium* bloom in Washington's marine waters every year
- PSP is a serious illness caused by eating contaminated shellfish
- Over 3,300 shellfish samples are tested annually for PSP
- Biotoxin monitoring is a coordinated effort between DOH, DFW, DNR, Local Health Departments, Tribes, Industry and Citizen Volunteers
- Variability in the timing and location of PSP blooms presents planning challenges to managers

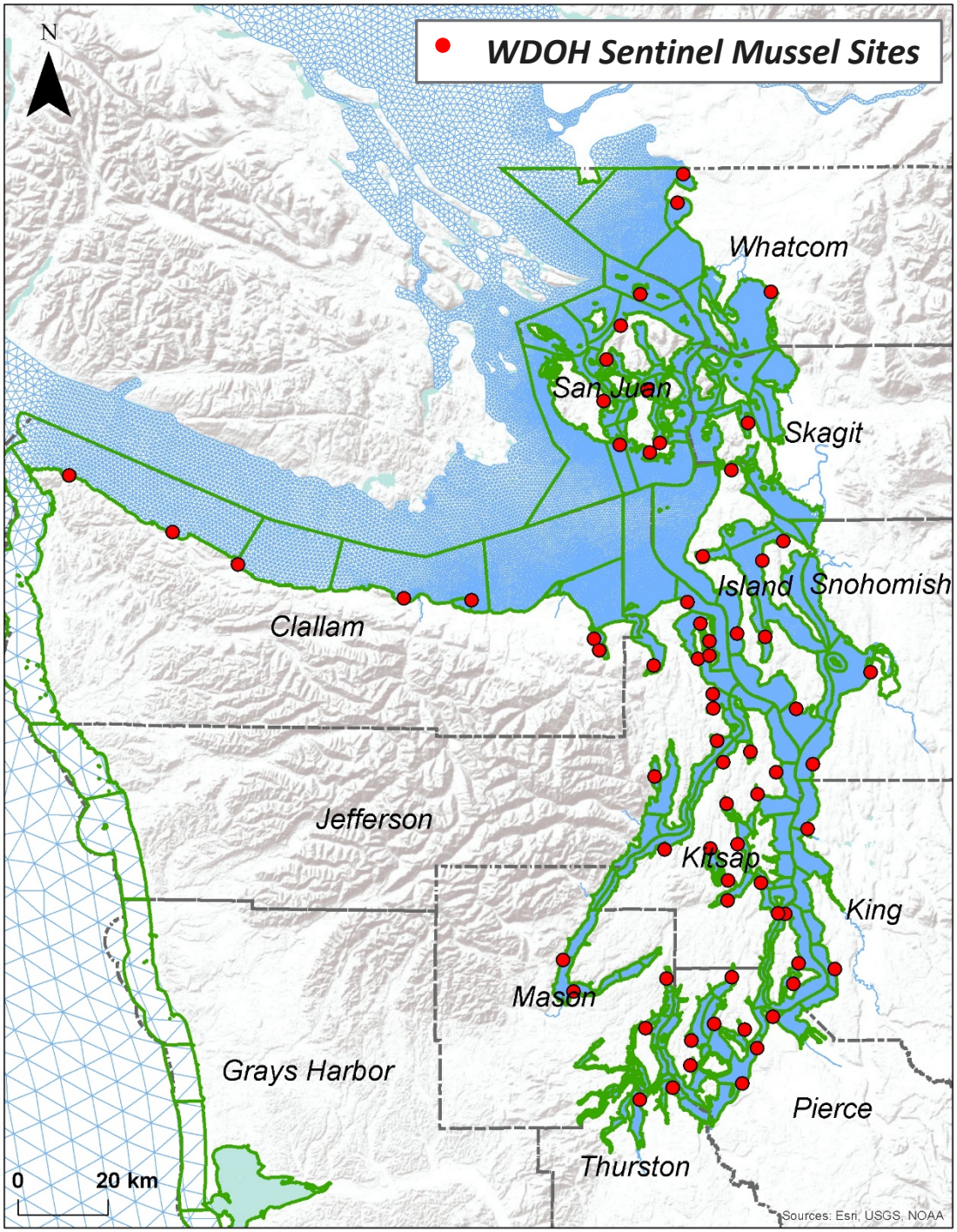
Phytoplankton tow 9/26/17
Credit: Penn Cove Shellfish, LLC

Development of PSP Risk Probabilities for Puget Sound



High-resolution Salish Sea Hydrodynamic Model

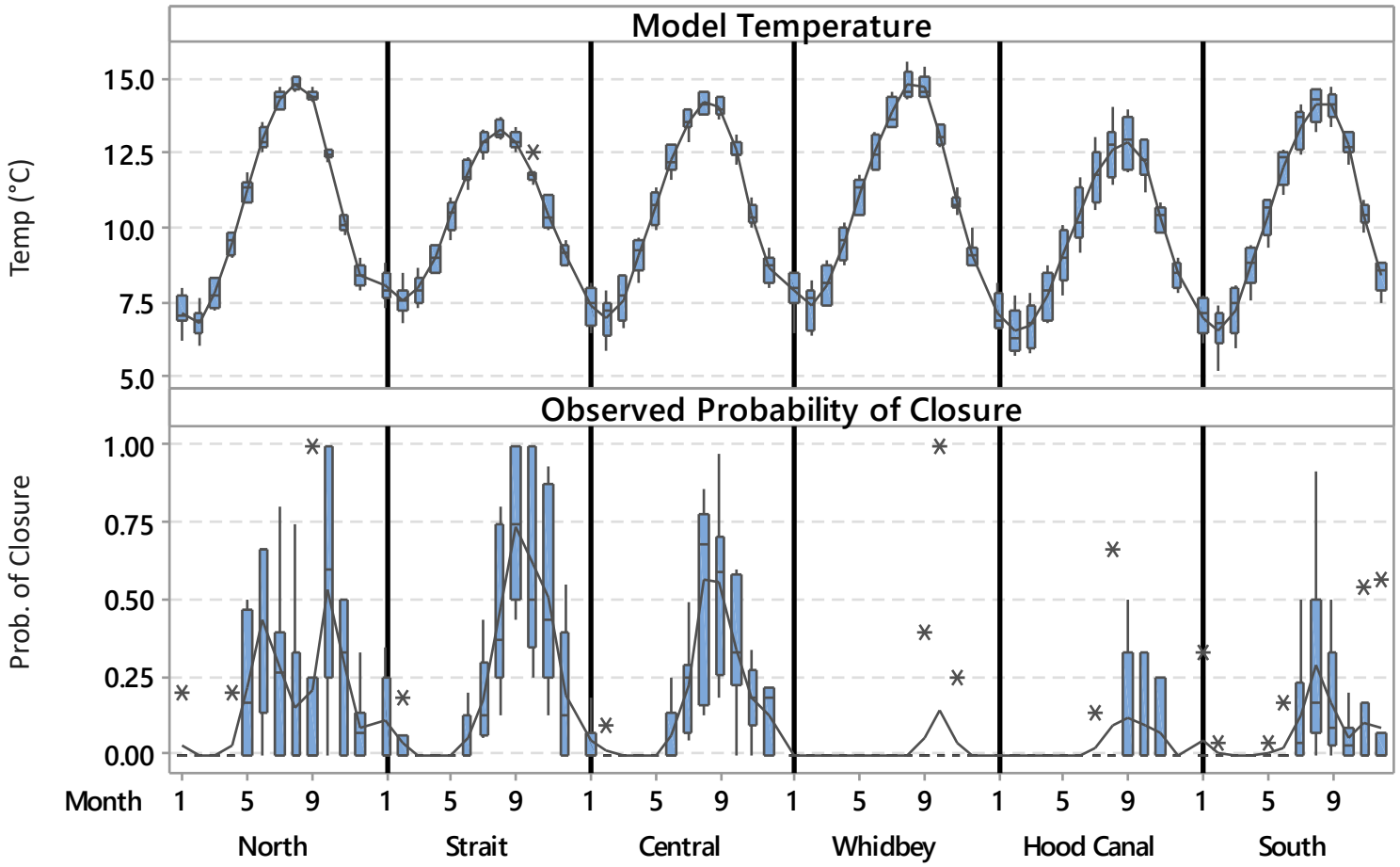
- *Inputs to model*:
  - Hydrology and climate forcing from UW DHSVM and WRF
- *Outputs from model*:
  - Temperature/salinity
  - Light availability
  - Residence time
  - Vertical stratification
- *Simulation periods:*
  - Recent: 2000-2006
  - Future: mid-century



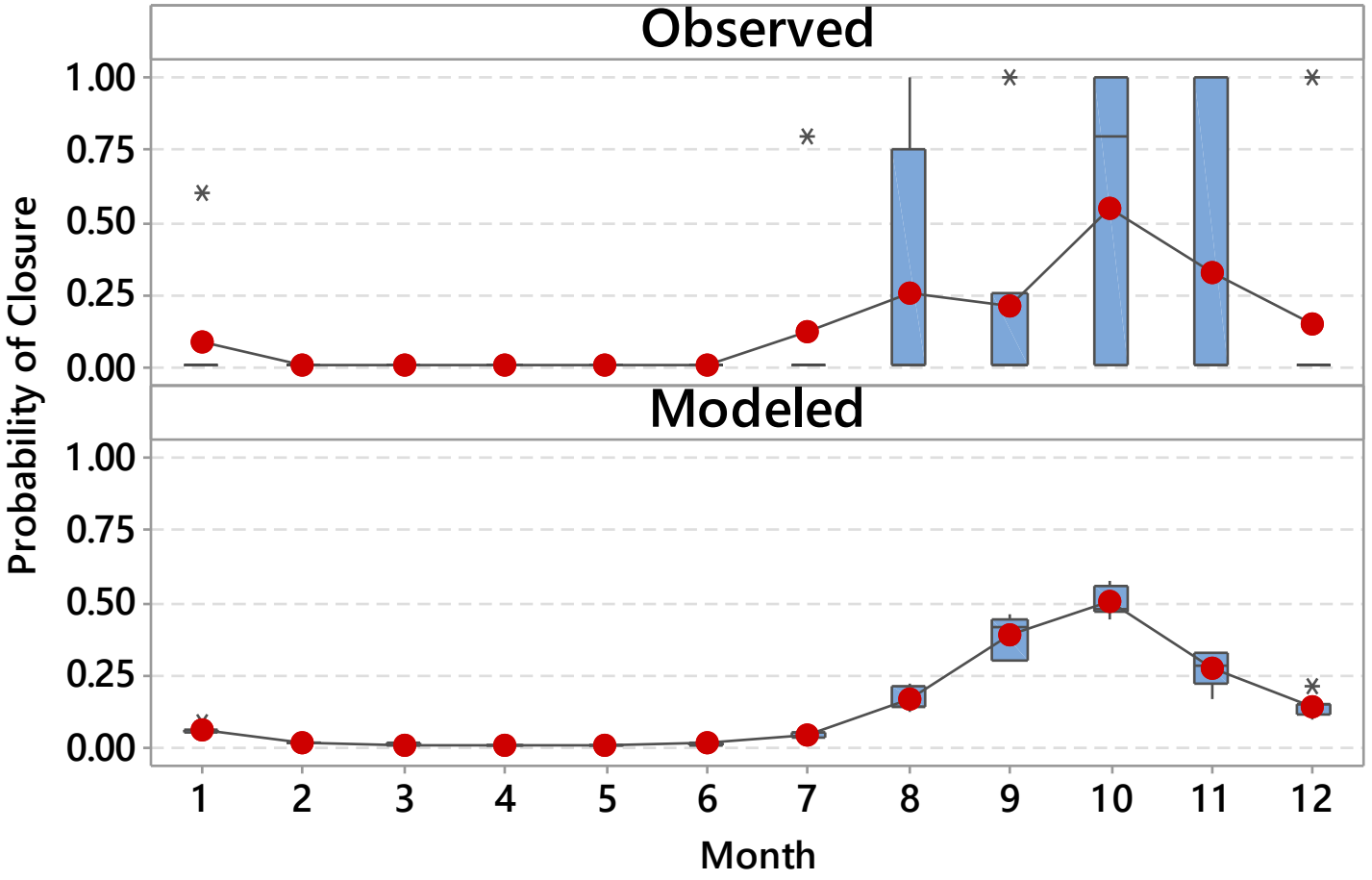
PSP Shellfish Harvest Closure Probabilities

- Mussel sentinel sites sampled year round
- 27 biotoxin closure zones located in 12 coastal counties
- # of closure days
  - Each site/zone
  - Weekly/biweekly
  - 2000-2006

Regional scale



Closure zone example – Bellingham Bay



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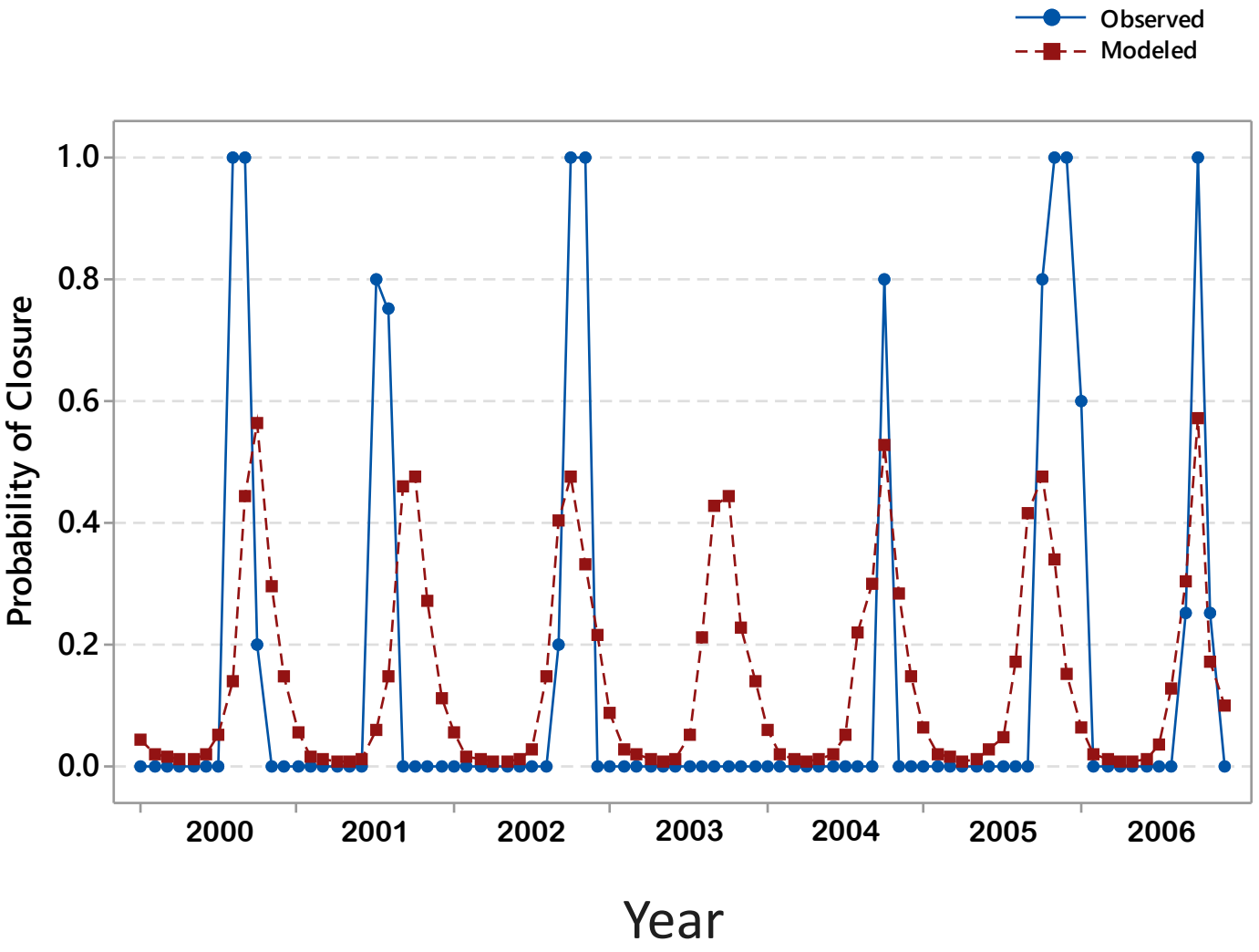

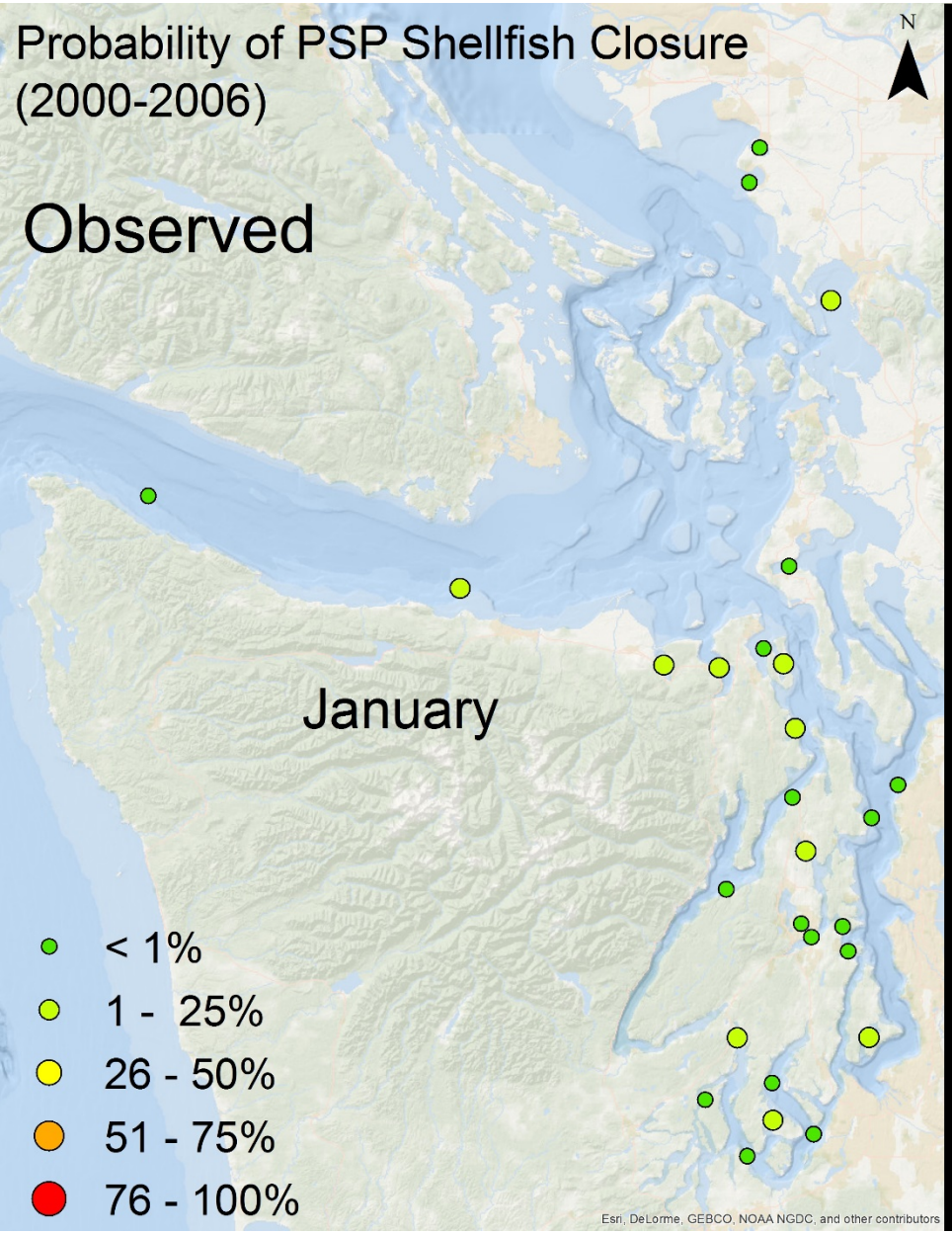
Probability of PSP Shellfish Closure
(2000-2006)
Observed
N
January
< 1%
1 - 25%
26 - 50%
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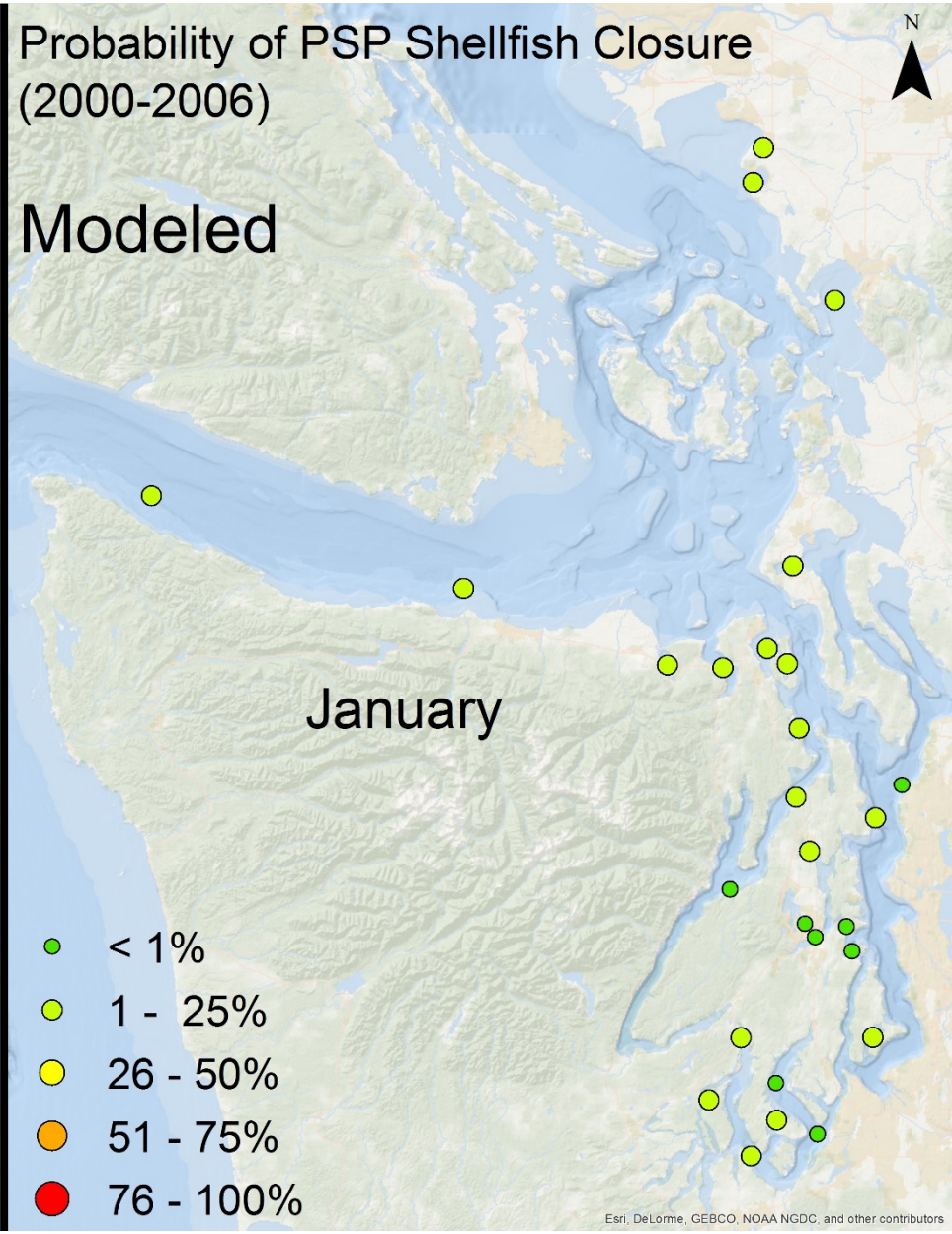
76 - 100%
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors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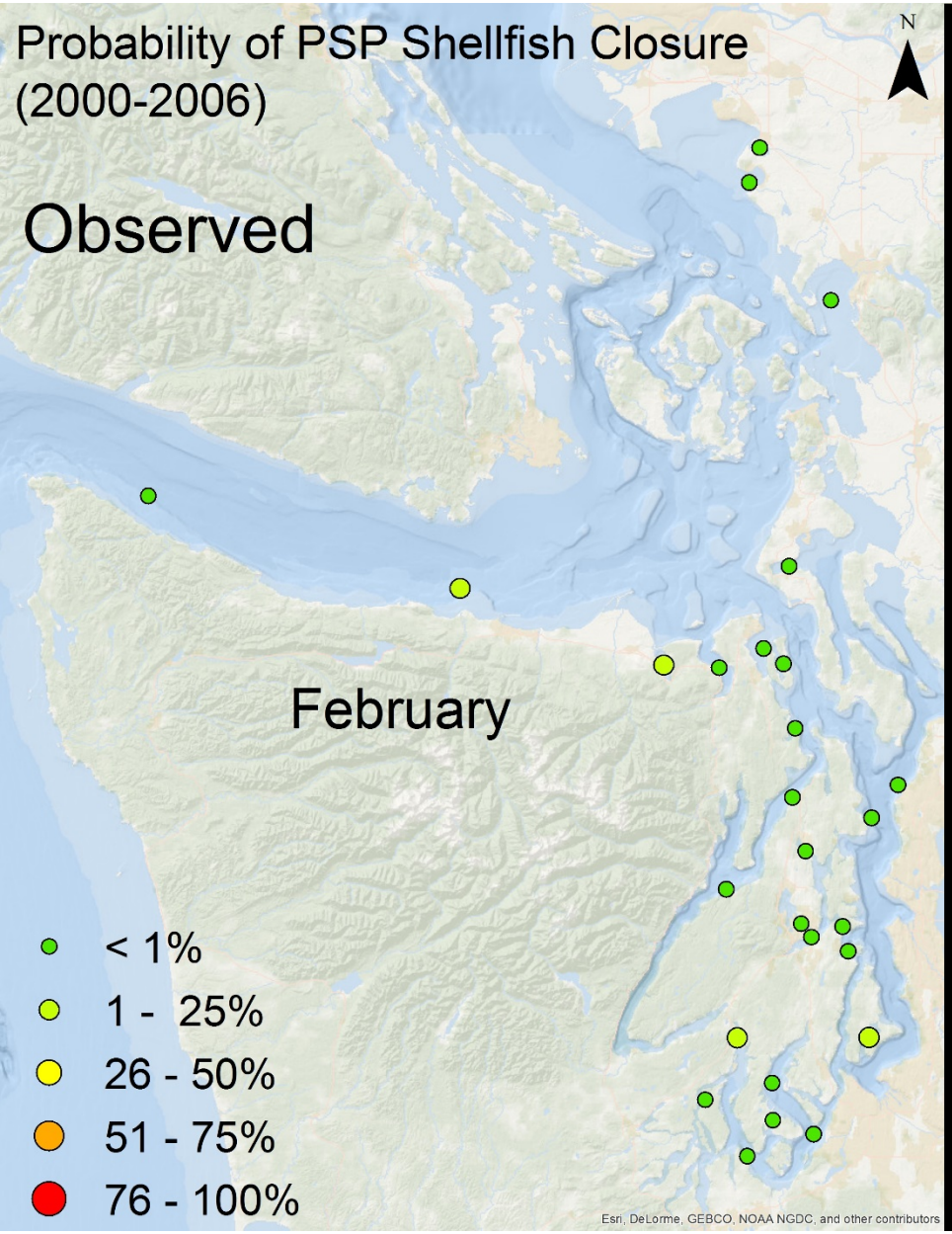
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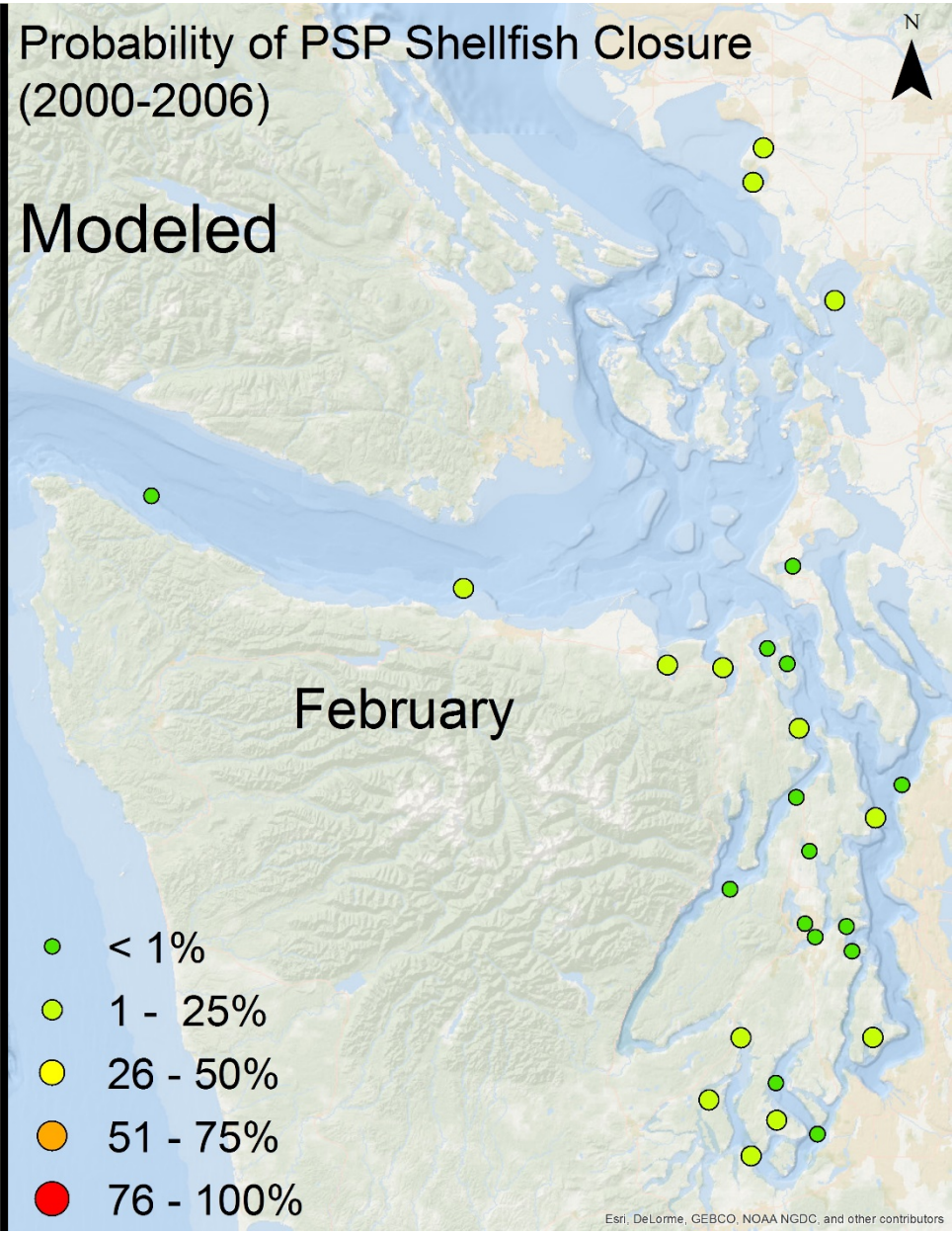
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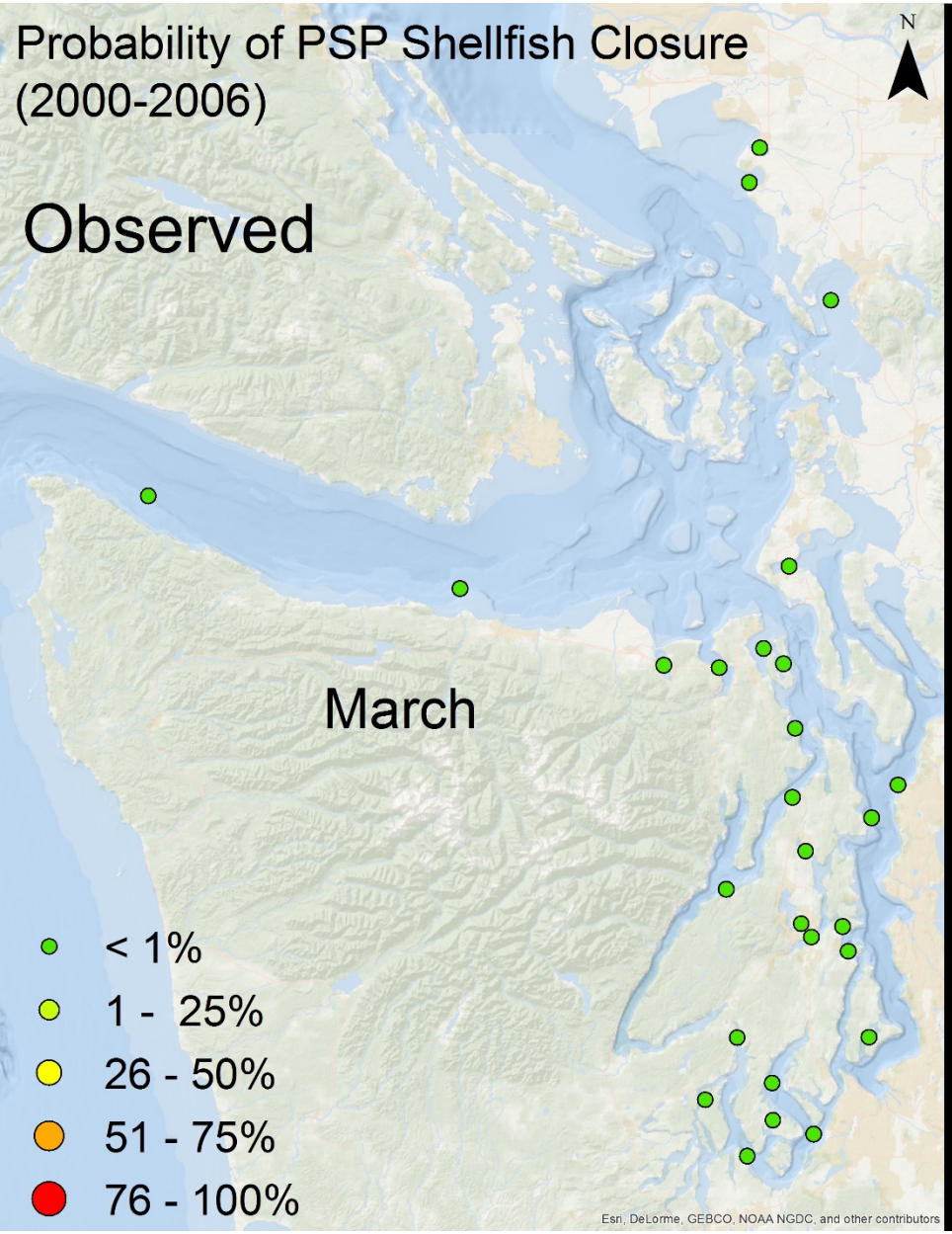
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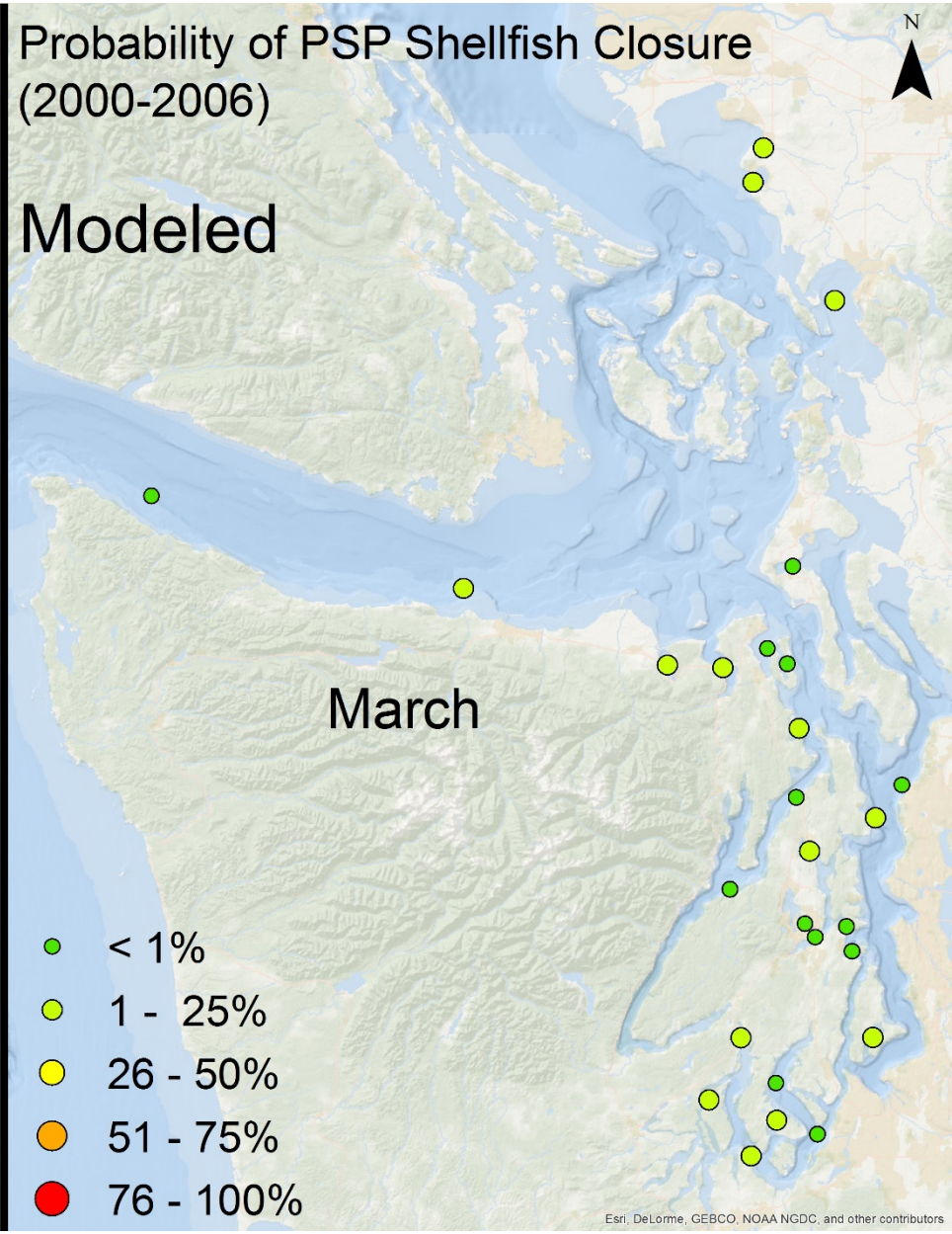
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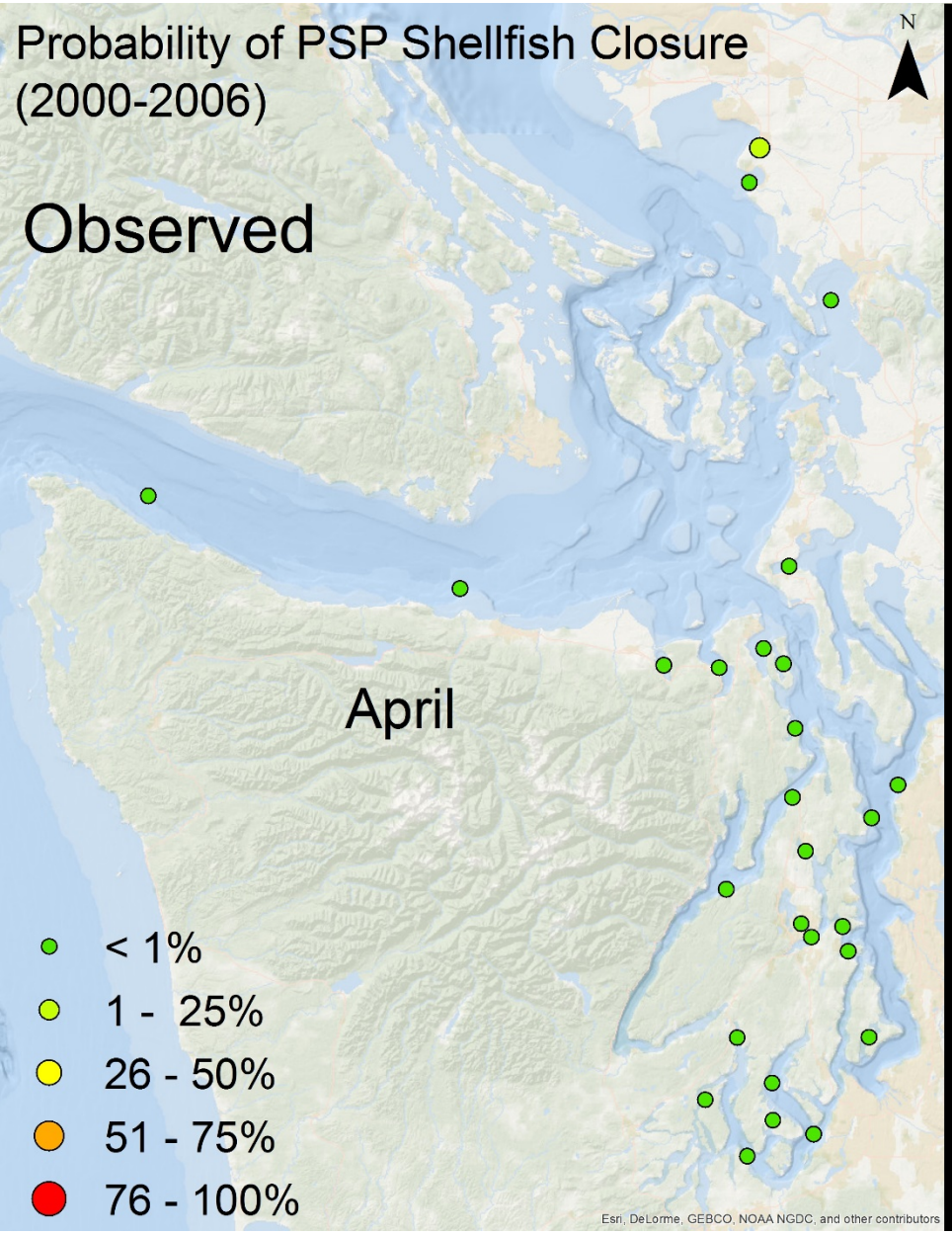
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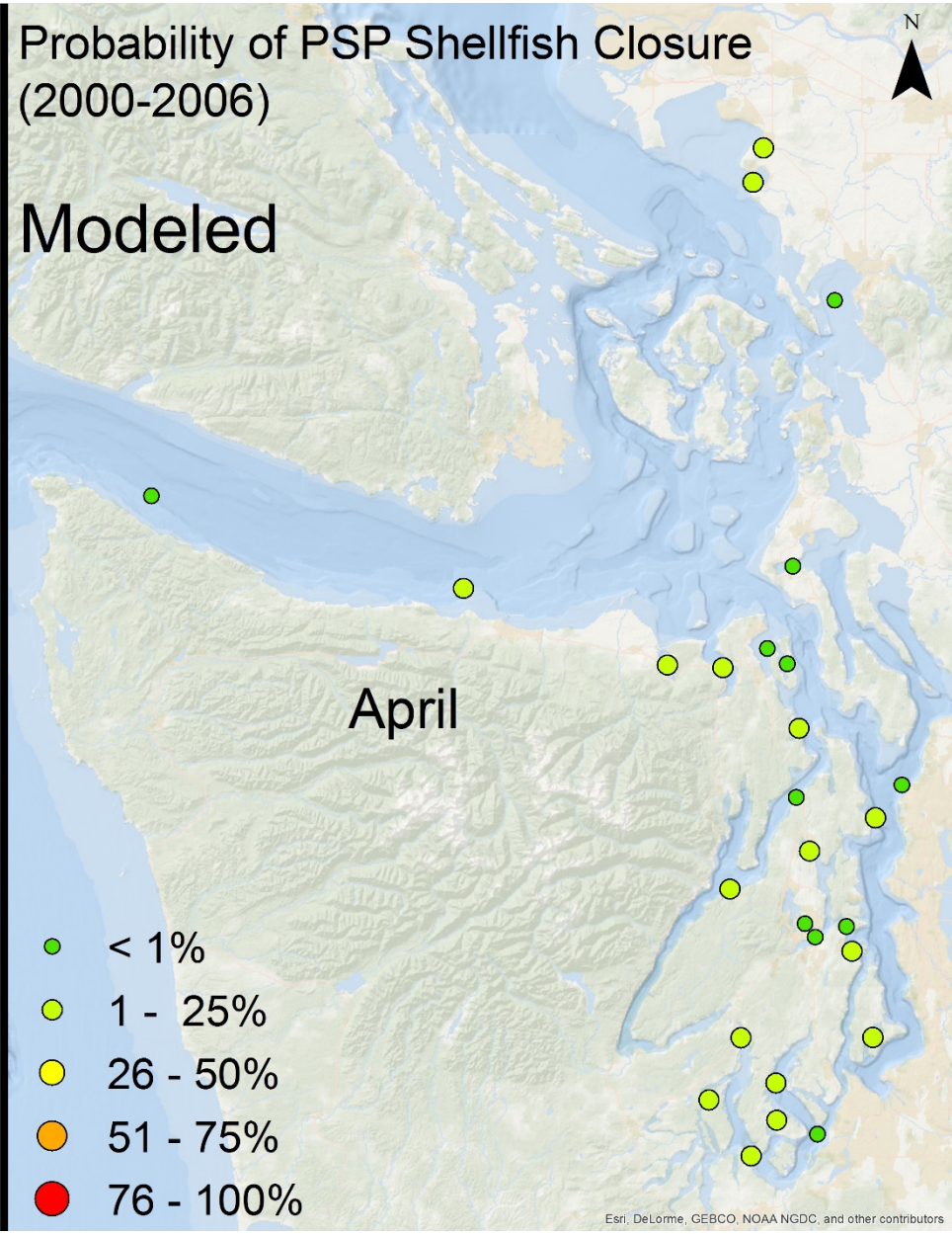
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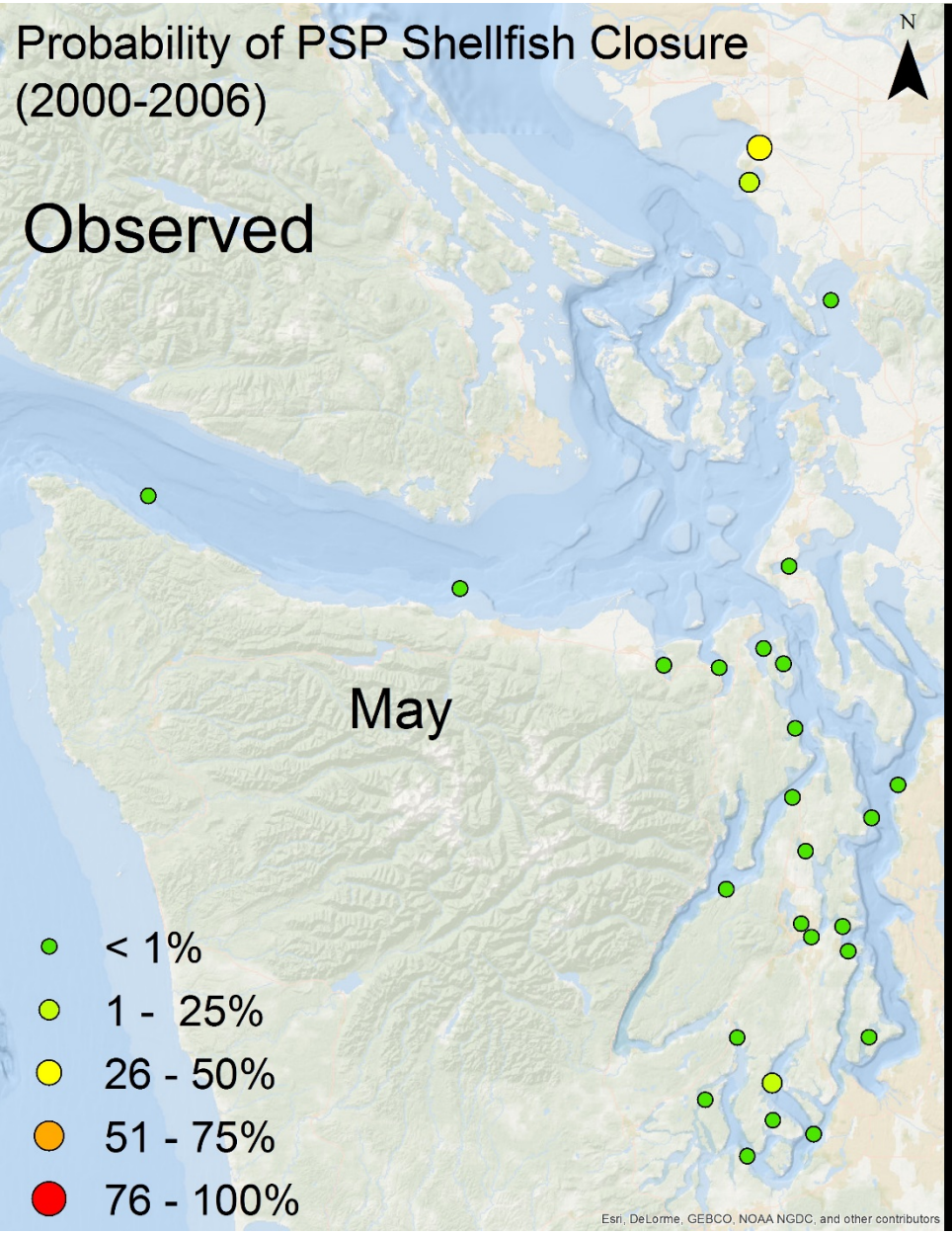
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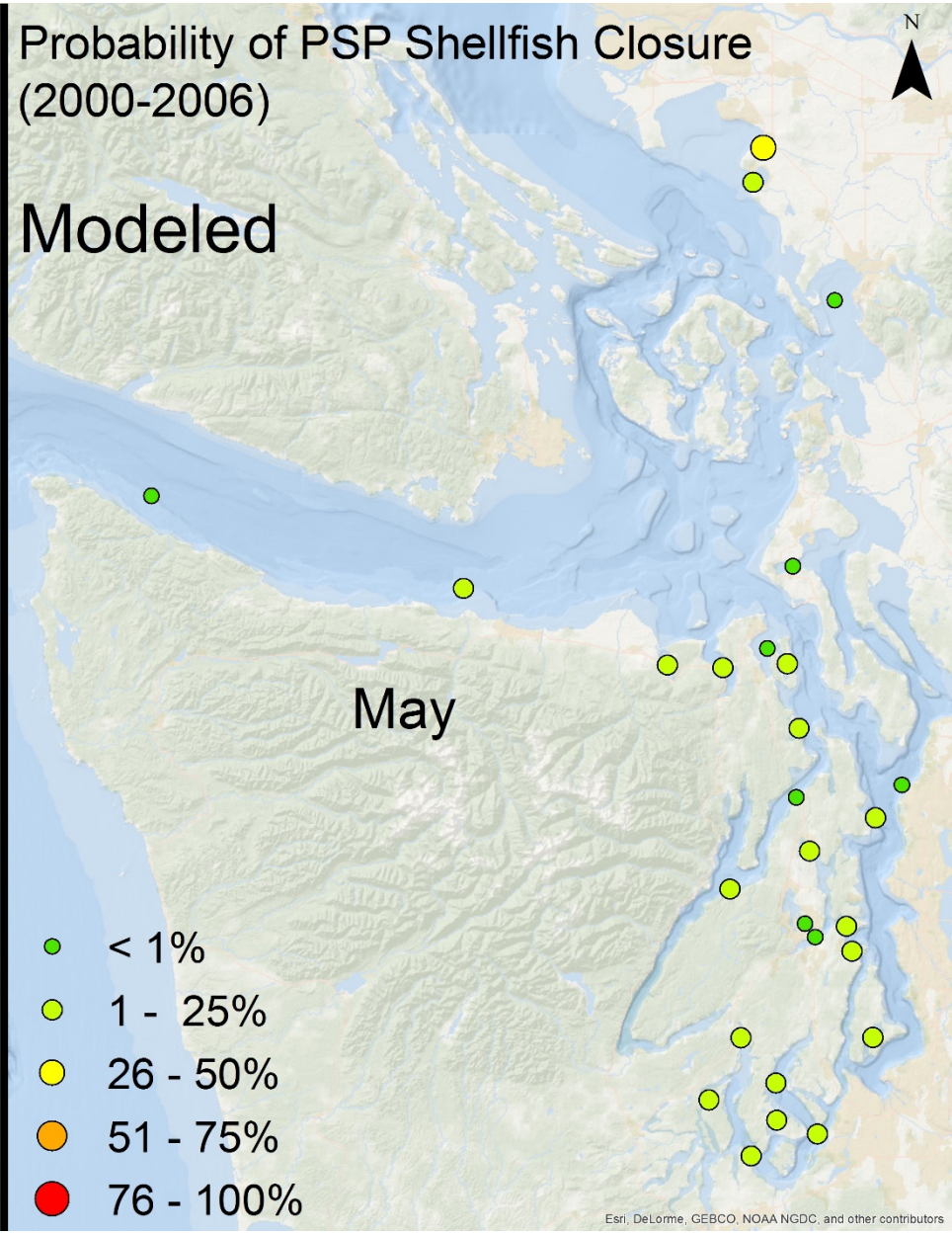
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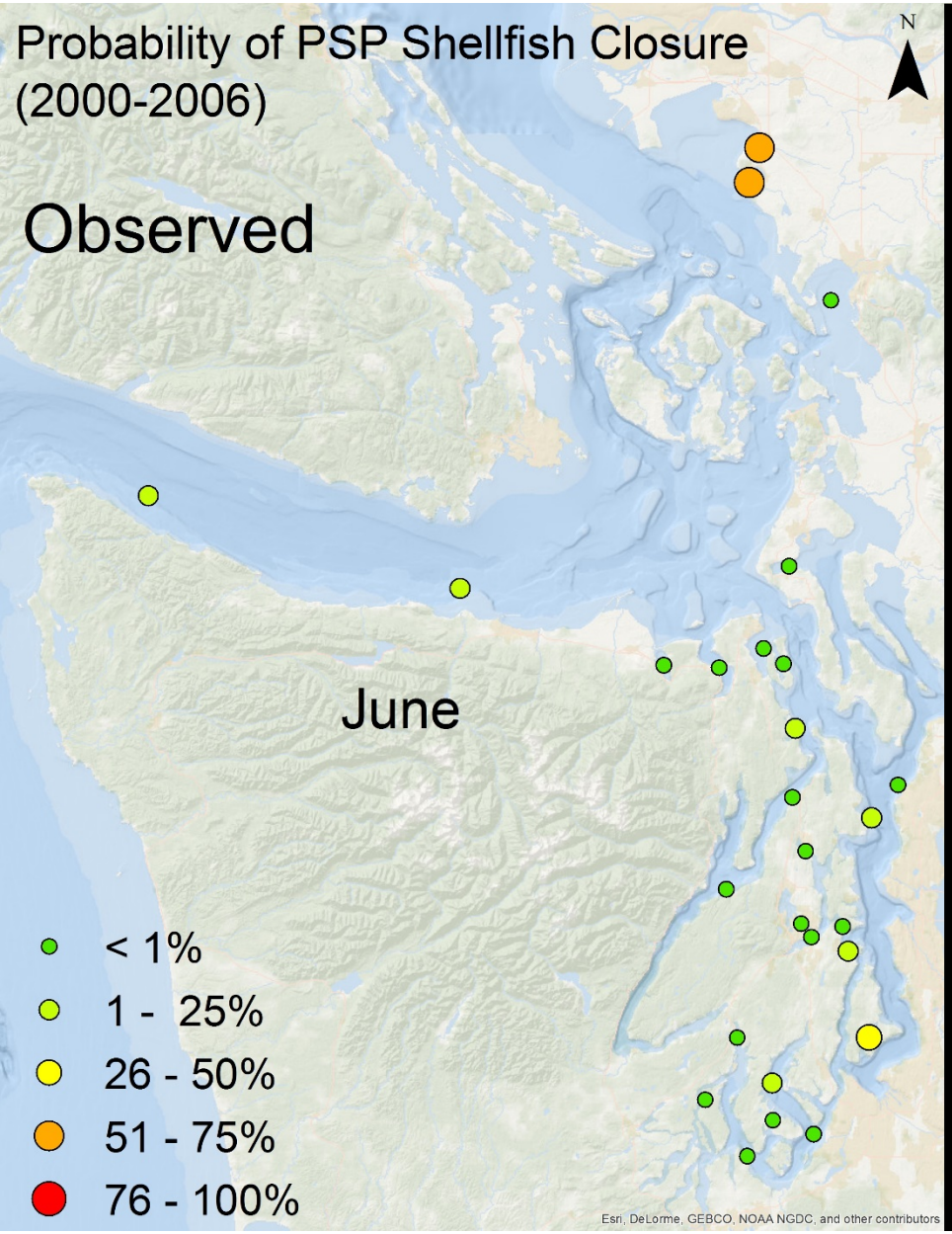
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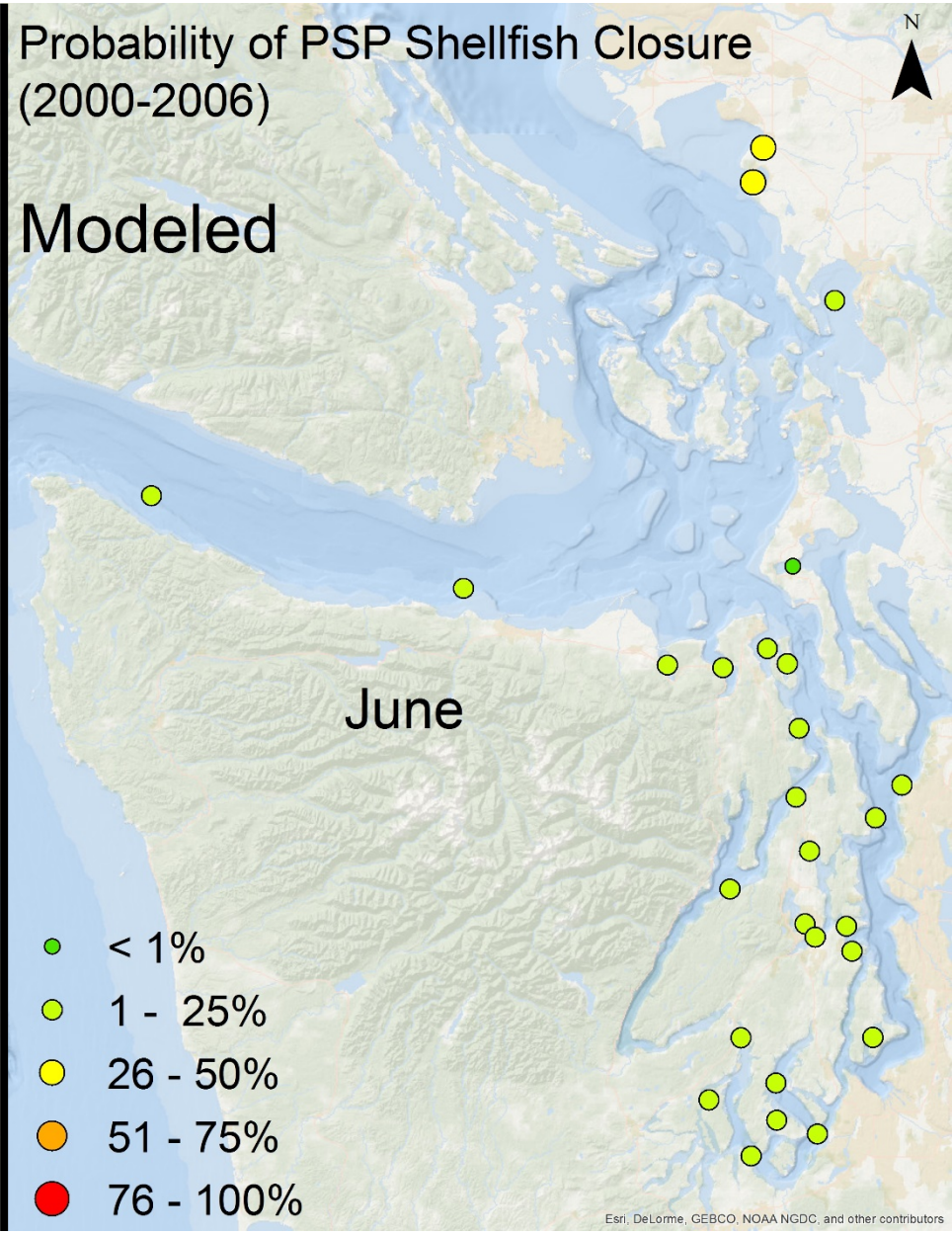
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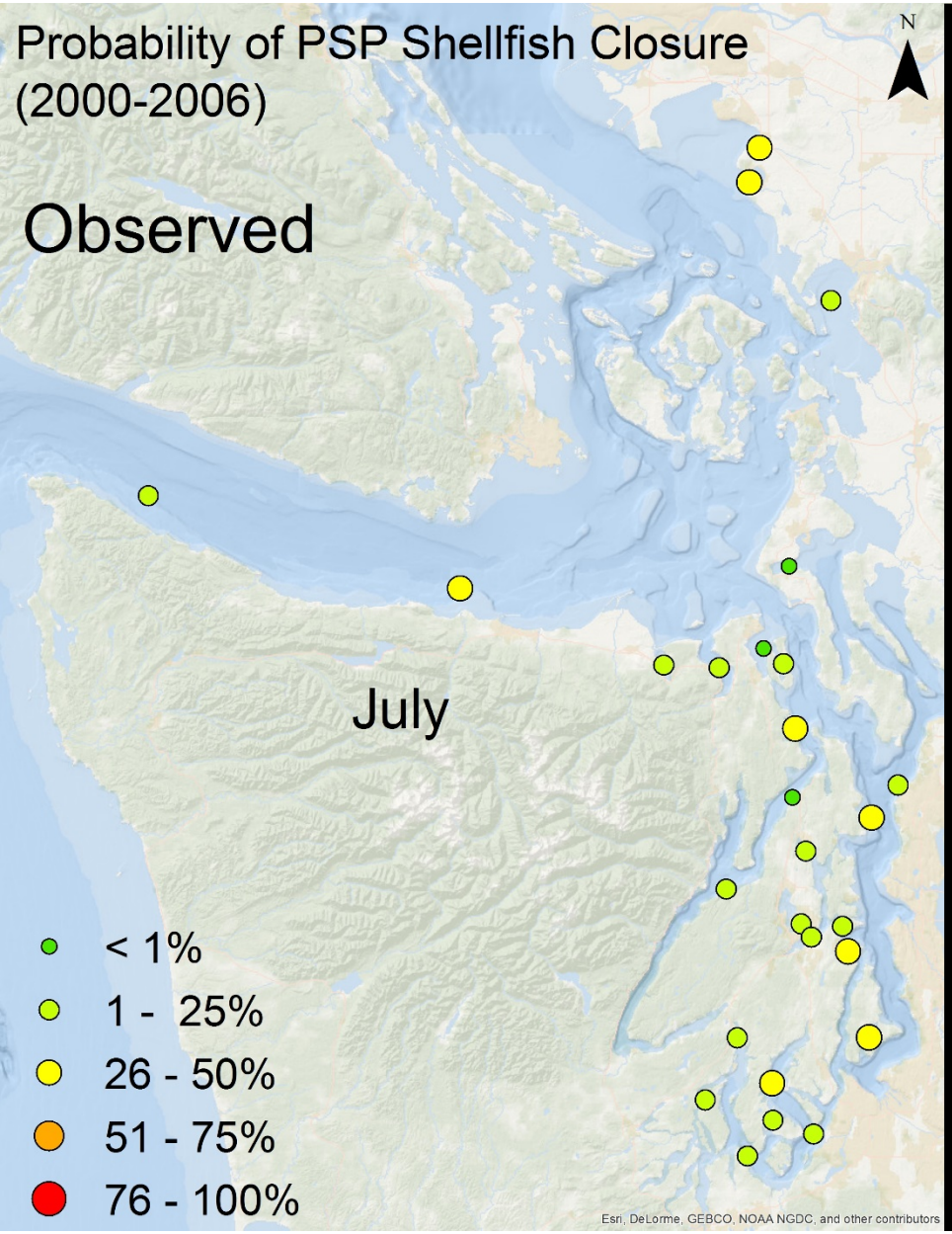
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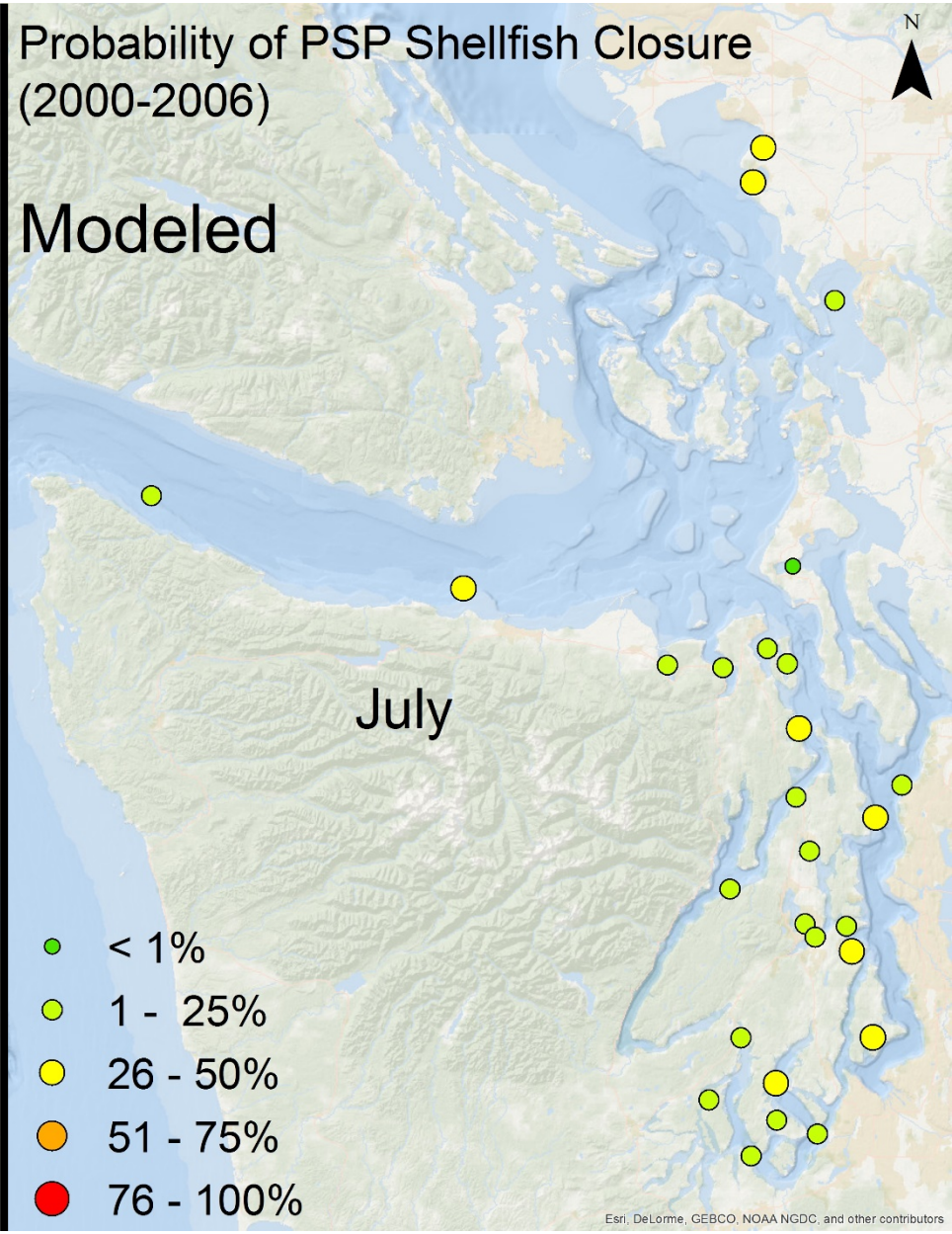
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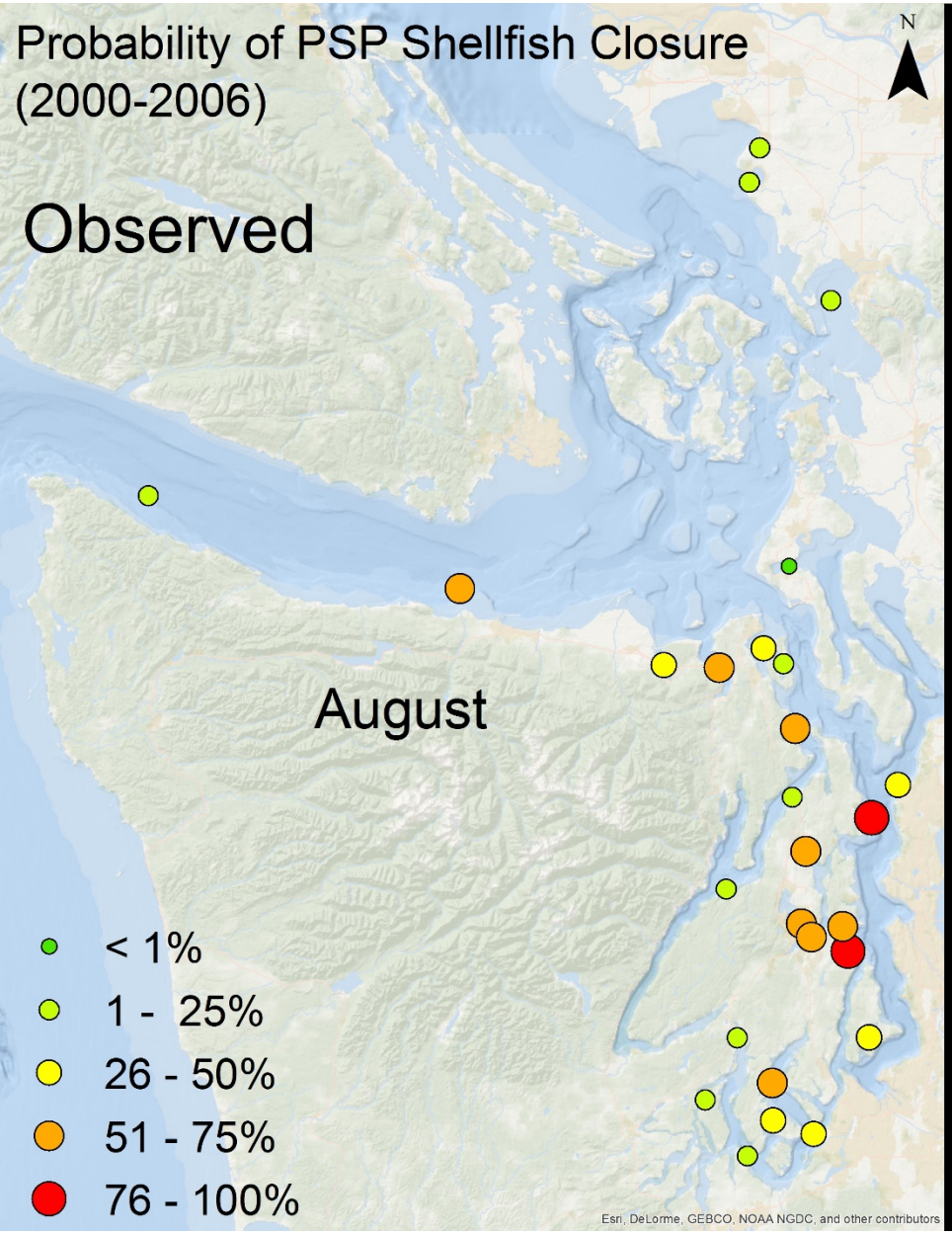
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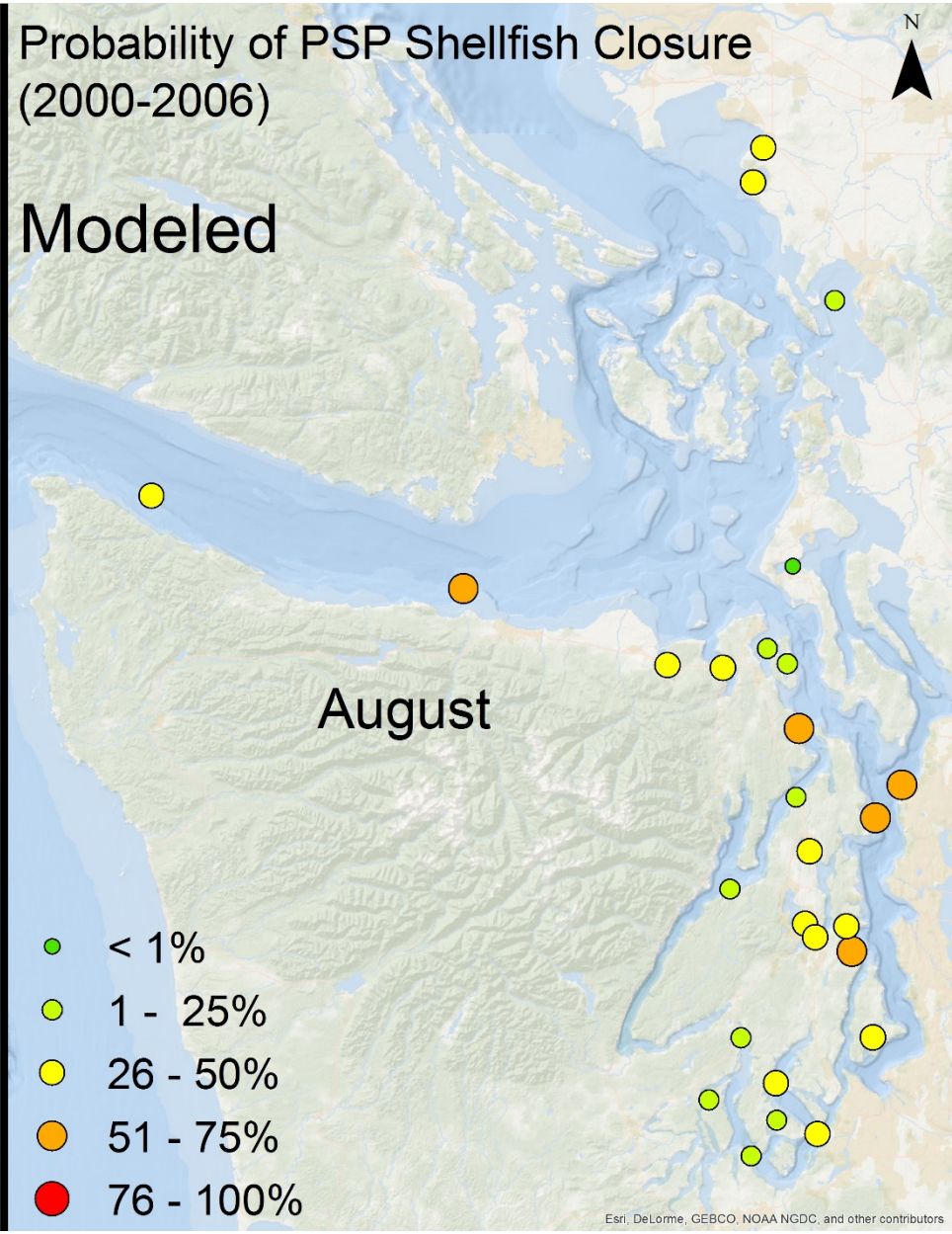
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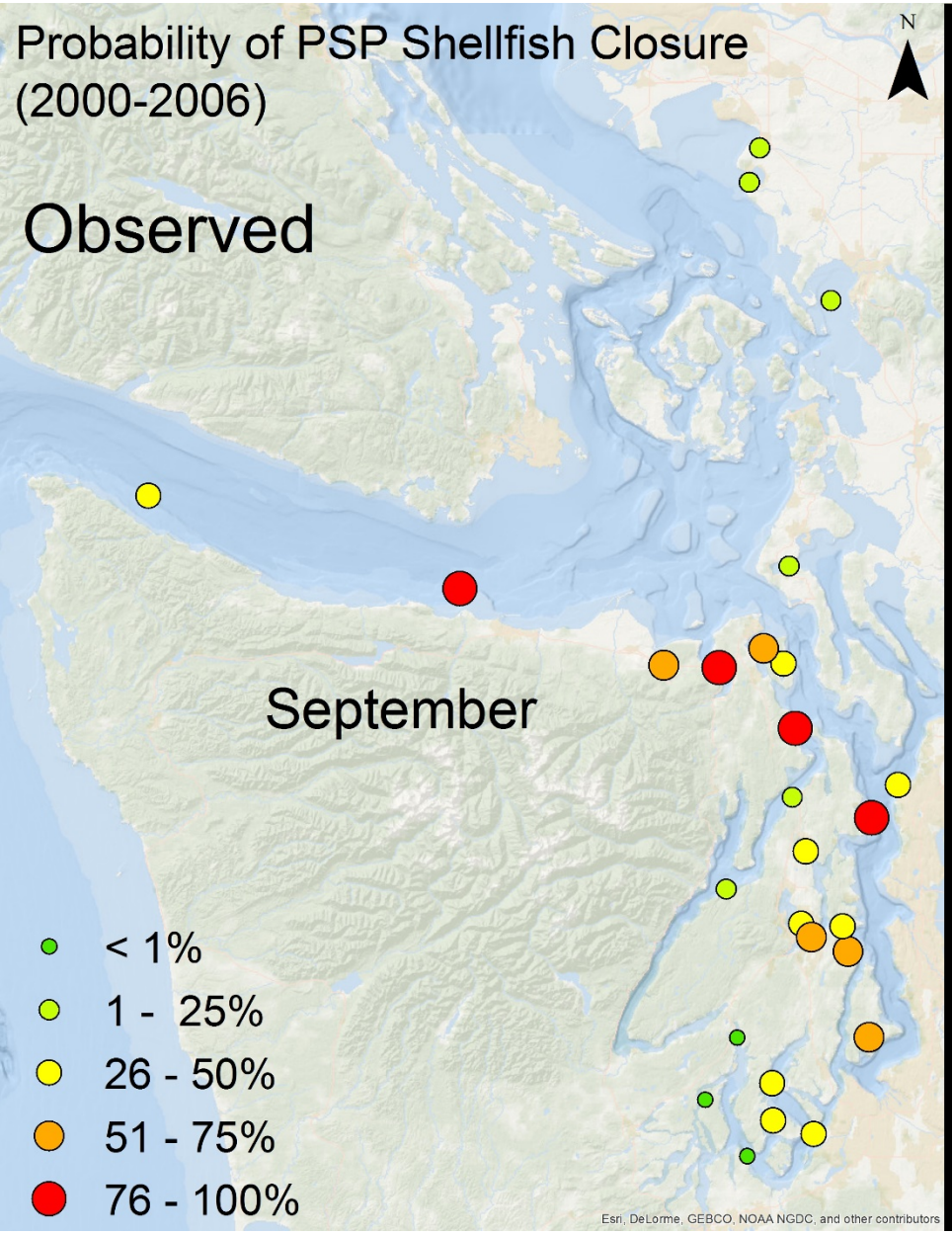
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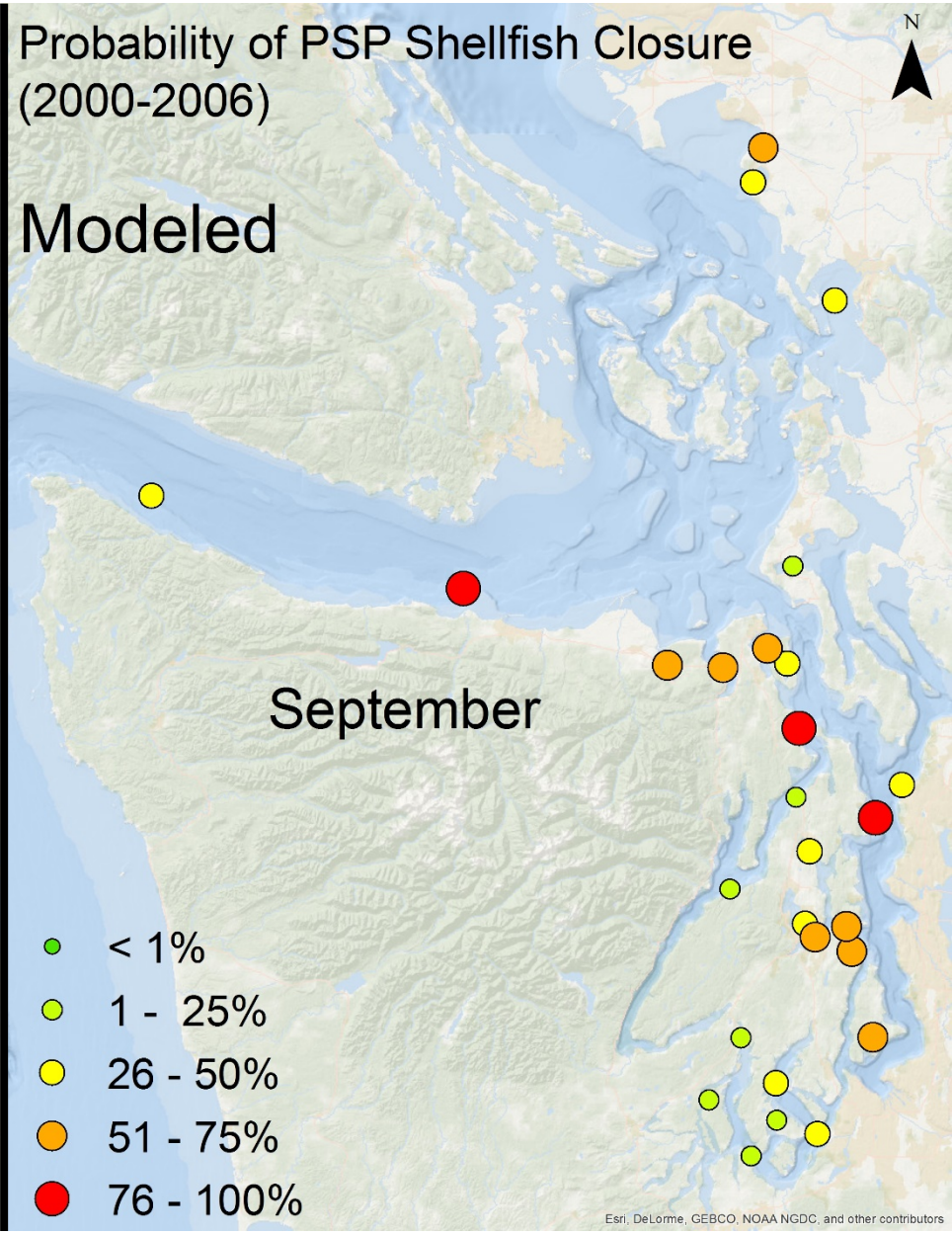
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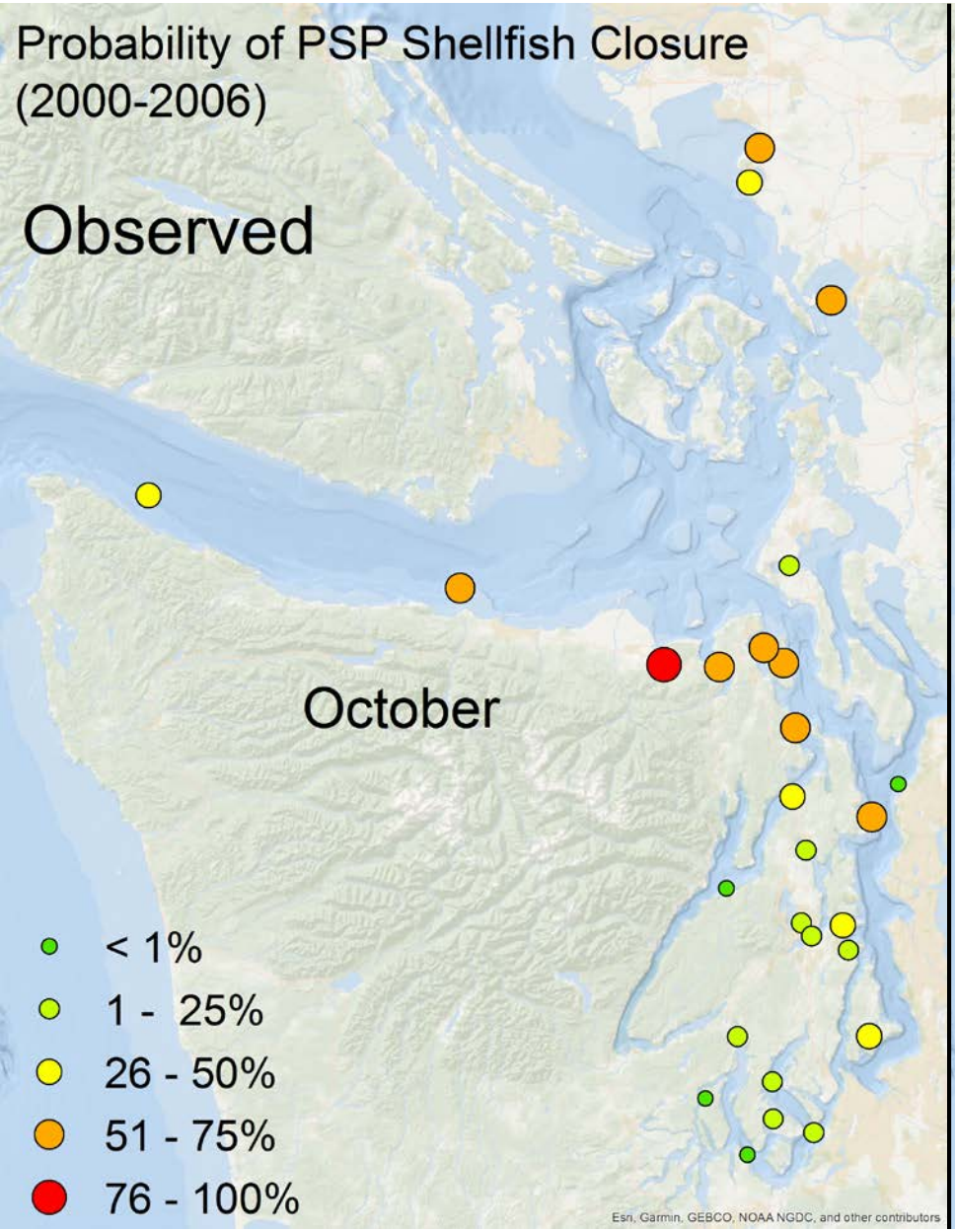
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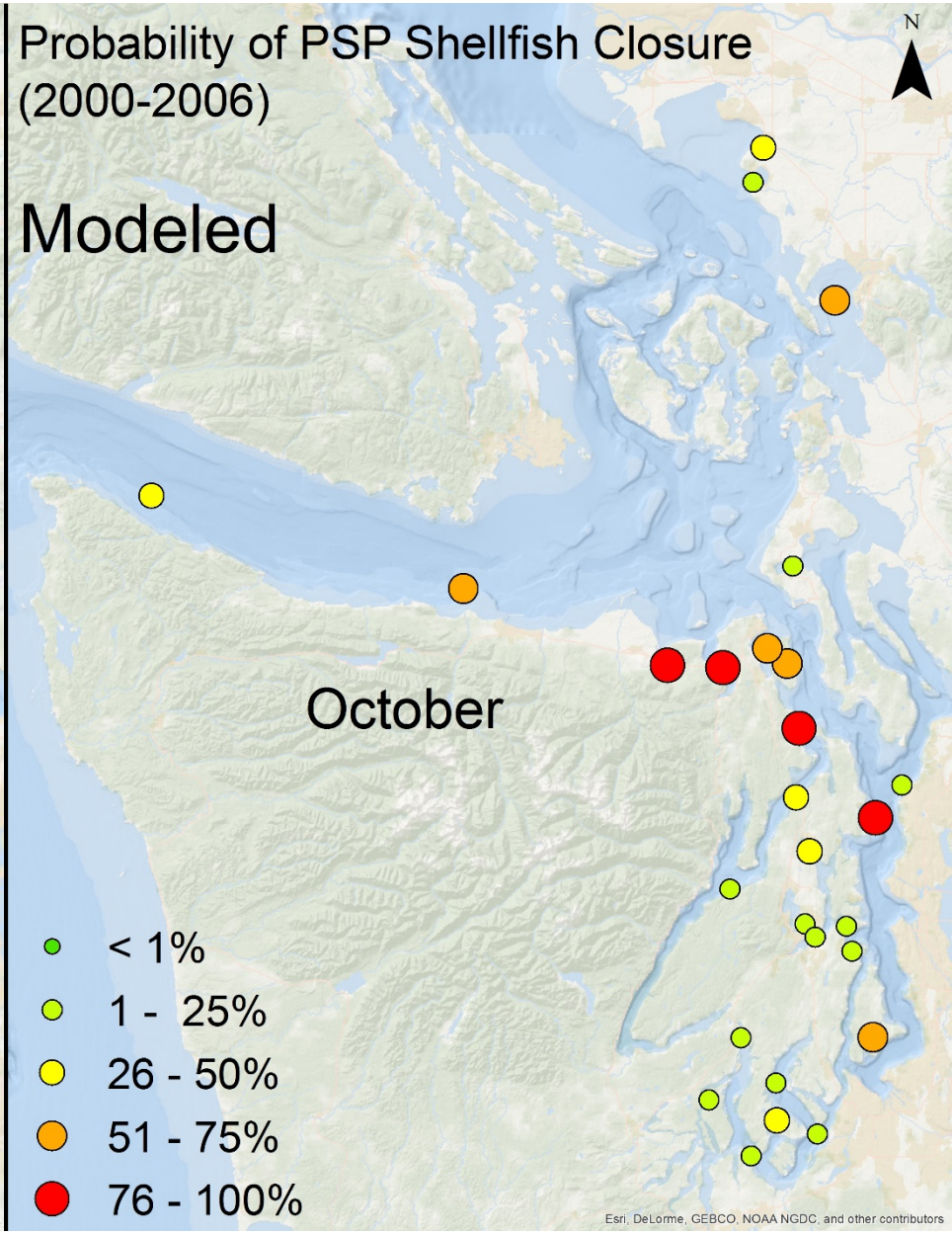
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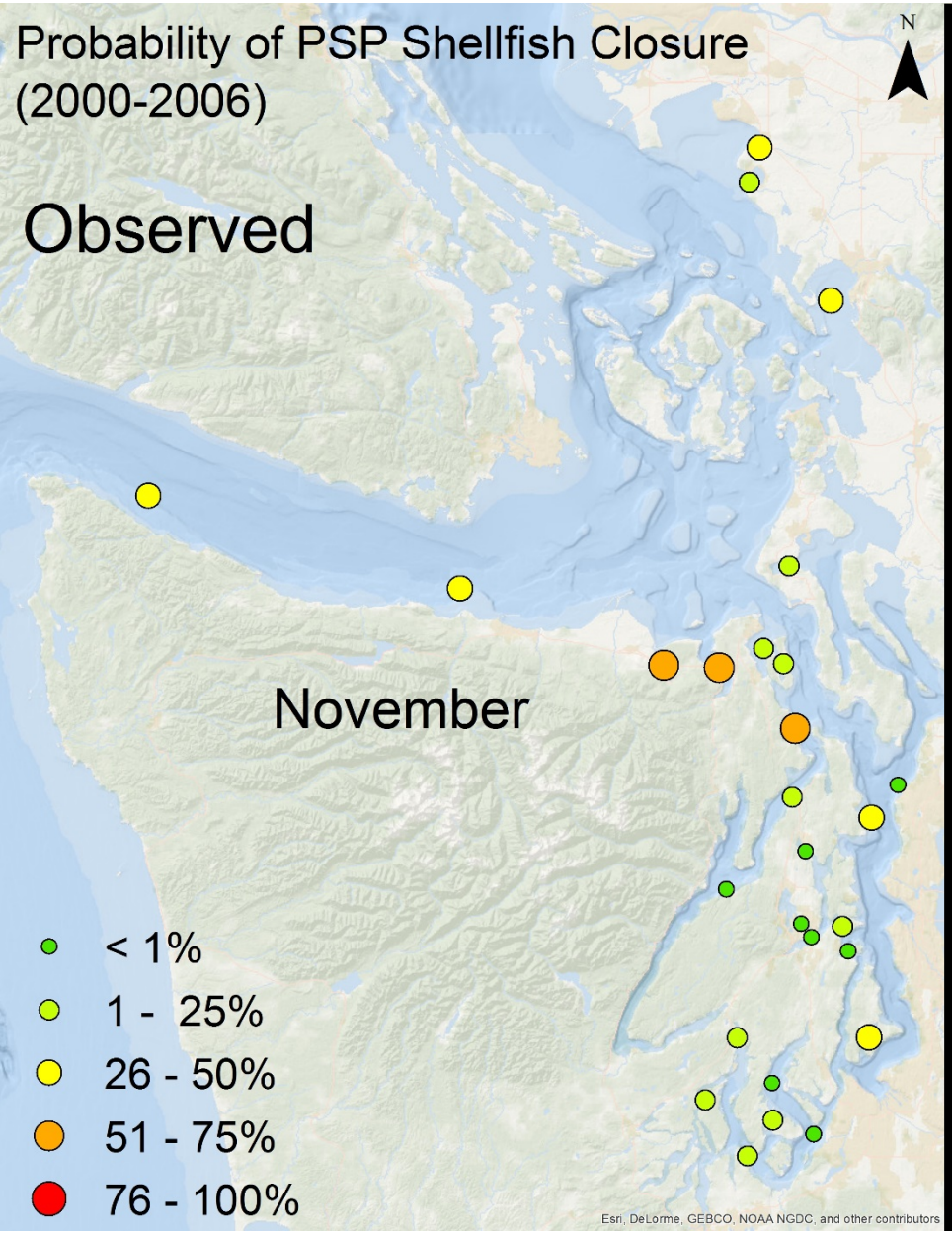
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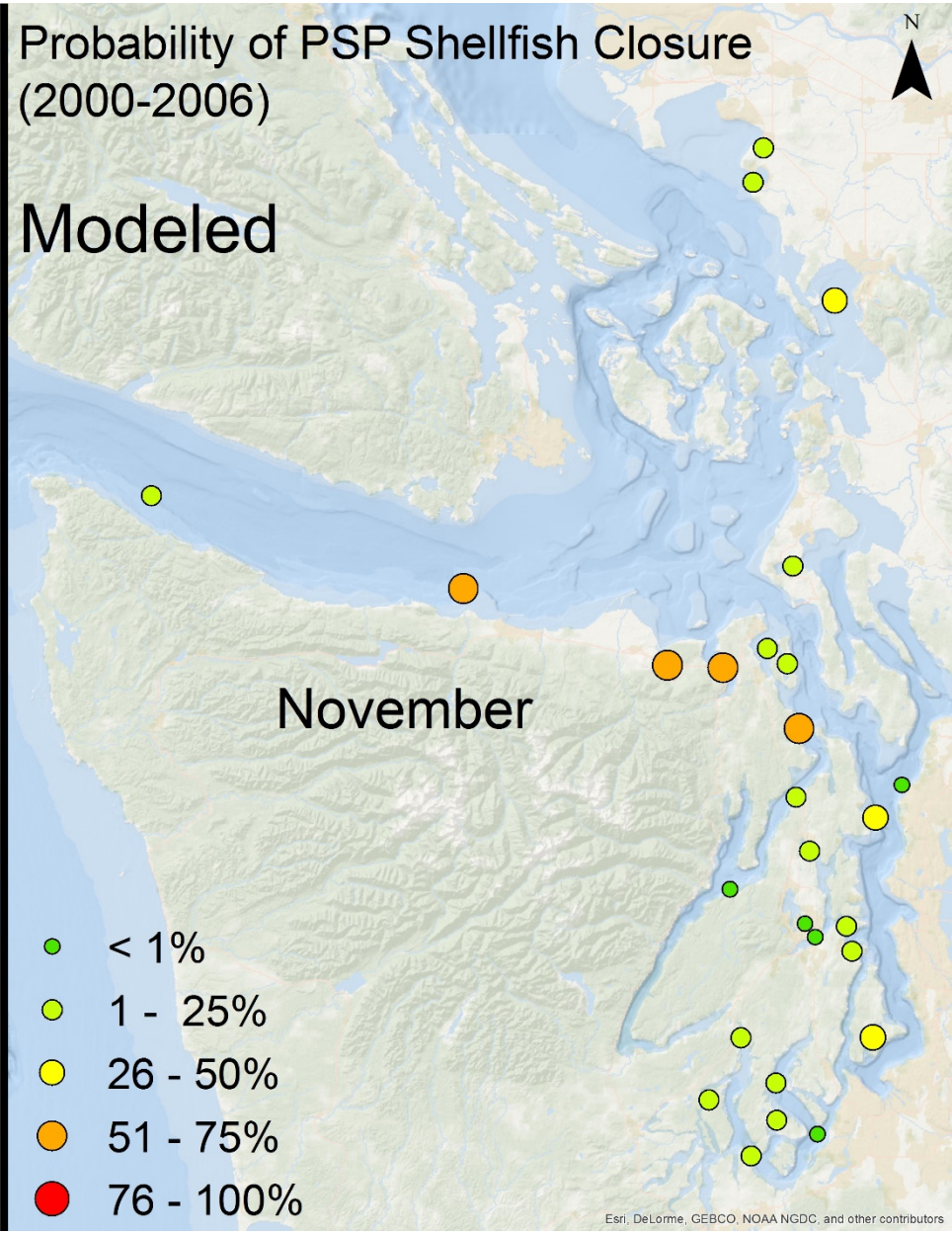
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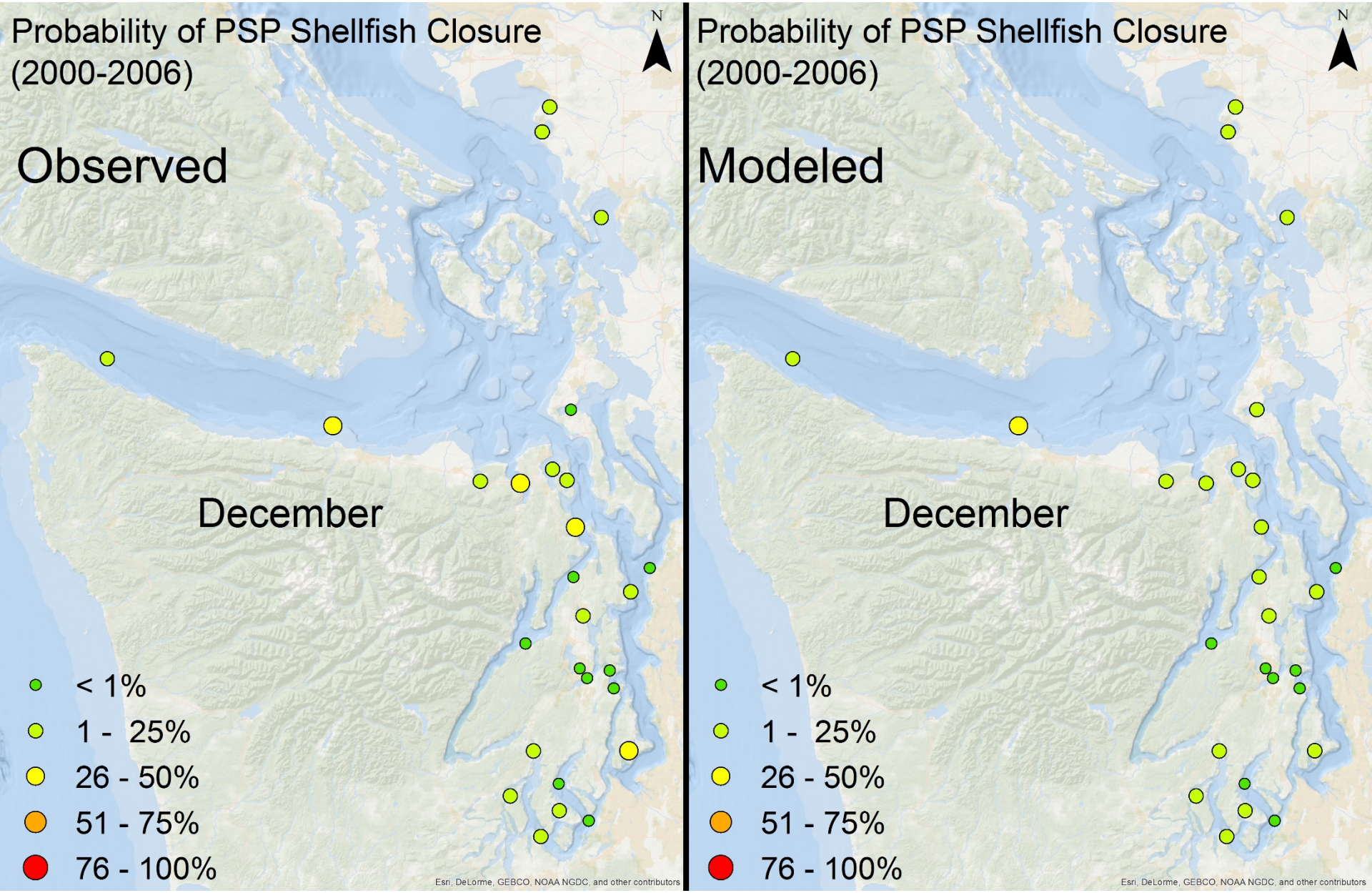
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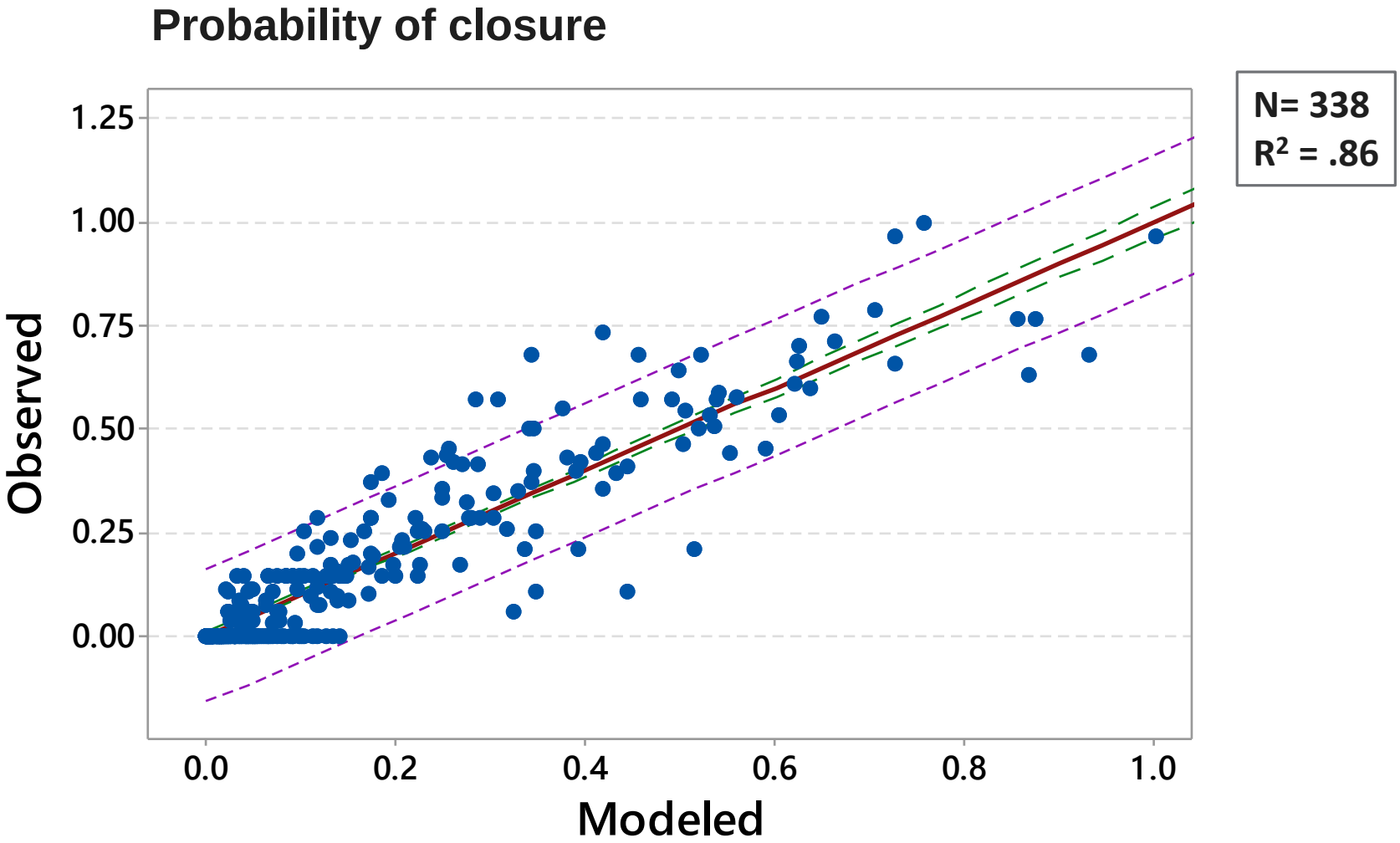
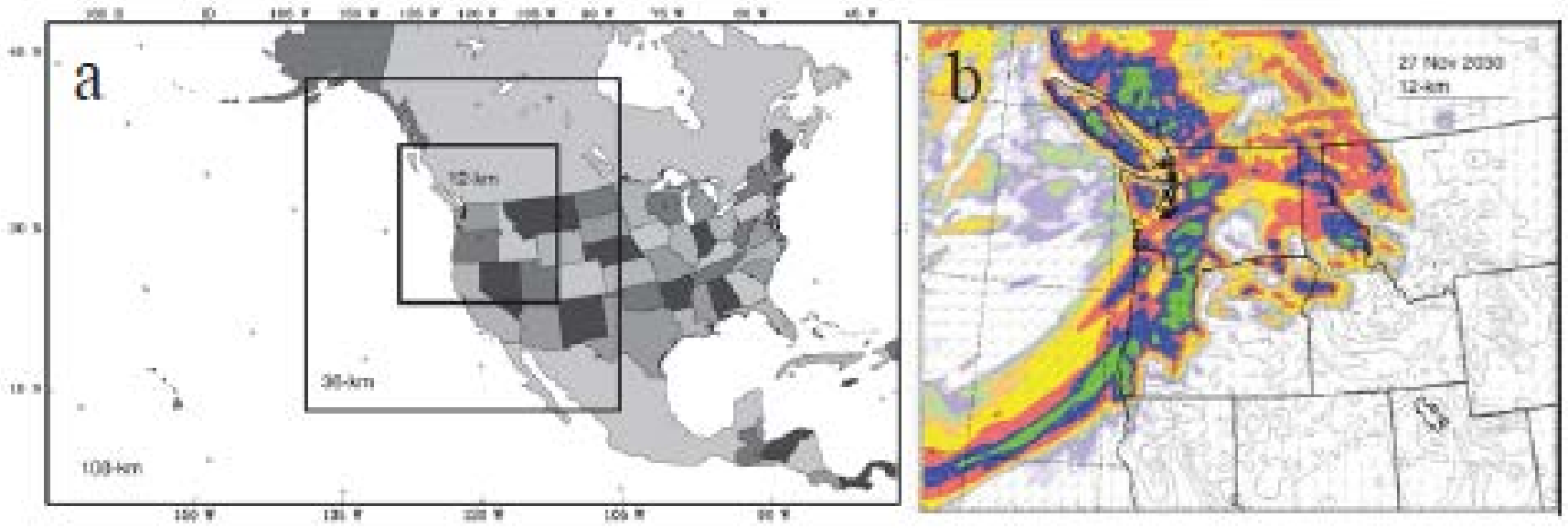
Model Skill Assessment



Next steps

- Assess probability of shellfish closure for future time period
  - Does the pattern of PSP risk change in the future?
  - How will this affect monitoring effort?



Conclusions

- Application of modeling approach to the scale of management units (biotoxin closure zones) is unique in Puget Sound
- Predicts seasonality of shellfish closure probabilities reasonably well
- Interannual variability of closures not well captured at all sites, hence…
- Not necessarily a good tool for next year predictions, but potentially a good tool for assessing longer-term (decadal scale) changes to the PSP bloom season

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Questions?

Contact information:

Dana Woodruff
Ph: 360-681-3608
Dana.Woodruff@pnnl.gov

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